REPORT

OF

DR. SIDNEY COUPLAND

ON THE

OUTBREAK OF SMALL-POX

IN

LEICESTER,

in 1892–3.

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Introduction.

In pursuance of instructions from the chairman of the Royal Commission on Vaccination I visited Leicester on November 11th, 1892, to gain information concerning the appearance and spread of small-pox in that town, and in particular to ascertain the precise methods in force to deal with it. I was courteously received by the Sanitary Committee then setting, and had an opportunity of learning from its chairman (Ald. Windley) the measures which had of late years been in operation in coping with this disease. Dr. Priestley, the Medical Officer of Health, kindly accompanied me to the Infectious Diseases Hospital and gave me particulars of the origin of the cases of small-pox which were then in the wards. Up to that time there were known to have occurred in the town 20 cases of small-pox, and the practice of prompt isolation on receipt of notification, not only of the patient, but of the persons known to have been in the company of the former had been carried out; the small-pox case being taken to a detached wing of the hospital, and the rest lodged in quarantine in another part of the building. When the small-pox first appeared, scarlet fever was very prevalent in the borough, and the hospital was crowded with children in all stages of that disease. It is not surprising therefore that, in spite of precautions, small-pox attacked some of these fever patients, and six of these patients are included in the number of those who had been attacked up to that time, whilst two others were attendants employed at the hospital. At the time of my visit the wards had been cleared of scarlet fever, and from that date forward the whole hospital was given up to the reception of cases of small-pox and quarantined persons.

I continued to visit Leicester periodically during the following year, and was thereby enabled to follow the progress of the epidemic, and to see personally nearly every case of small-pox admitted into hospital. The report which I now submit contains the information thus obtained. This report covers a period of 70 weeks, commencing from the week ending August 27th, 1892, to the week ending December 23rd, 1893. It will be seen that within this period one or more fresh cases arose in Leicester in each of the weeks except five, but that in no week did the number exceed 21, the average being five attacks per week. Of the total—357 cases, there were 12 which did not come to the knowledge of the Sanitary Authority until the occurrence of other cases subsequent to them. These cases had either not been visited by medical men, or had escaped notification, the mildness of their type causing them to be unrecognised at the time. The first case of all (W. S.) falls into this category.

Besides the infection of the inmates of the fever ward in the early weeks of the outbreak, already alluded to, it is noteworthy that during a subsequent period there was a disproportionate incidence of small-pox upon the inhabitants of Newfound Pool, an outlying part of the borough, in the vicinity of the hospital. The thorough investigation made by Dr. Priestley into the origin of these cases points strongly to aërial infection of the locality from the small-pox wards. If this be so, it leads to the conclusion that more than one-fifth (viz. 77) of the whole number of cases received their infection directly or indirectly from the hospital. For of those known to have been infected at the building there were 19, viz. 13 children admitted for scarlet fever and 6 attendants or nurses who were attacked at various dates.* Three cases were infected from these; whilst 55 occurred in the Newfound Pool district.

It is to be regretted that the proposal to erect new buildings upon another site for the accommodation of small-pox patients was not carried out.

A point of especial interest in regard to the method of dealing with small-pox at Leicester is the system of quarantine of infected families, a plan which had been in use for some years, and was being carried out when I first visited the town. It seemed to me that in the adoption of this practice Leicester might claim to be distinctive, although to a large extent a like system has also been introduced at Glasgow, Leeds, and elsewhere. In other respects—notification, isolation of patients, house disinfection—the practices were similar to those in vogue in other places. Indeed, theoretically, such a system of quarantine—if carried out in its entirety—would seem to be especially applicable to the arrest of small-pox outbreaks, owing (1) to the definite period of

* To these cases of hospital infection there should perhaps be added the following:—No. 116, W. R., a plumber, at work in the building 14 days before sickening; No. 155, W. H., apparently infected in quarantine; No. 160, F. W., who came to meet her sister on her discharge from hospital; No. 295, C. P., known to have been in close vicinity of hospital a fortnight before attack. Another case, No. 295, M. B., was infected by visiting an infected house in Newfound Pool (*see* Table of Cases). The inclusion of these cases would bring the total attributable to hospital infection up to 82. I find that Dr. Priestley adds some others dwelling "within the hospital area" at the north end of the town—making a total of 85. (*See* Report, Medical Officer of Health, 1893, p. 133.)

incubation of the disease, and (2) to its infectivity prior to the appearance on the patient of a distinctive rash. Therefore a quarantine extending over 16 days from the removal of the patient would cover the period at which any case amongst those exposed to infection would be likely to arise; whilst the strict supervision of persons who have thus been exposed would enable steps to be at once taken to isolate any quarantined person who presented symptoms of illness. In practice the perfect adoption of this plan necessitates the provision of accommodation extensive enough to lodge the members of several families, besides requiring the willing co-operation of all concerned. For although its adoption ought to prevent an outbreak of small-pox from assuming epidemic proportions, yet when the disease is prevalent in all parts of the country, the liability of a town of the size of Leicester to receive fresh importations is very great. Indeed, it will be seen that many cases were thus imported during the present outbreak. Where the accommodation is insufficient, and especially where, as in this instance, the provision for quarantining is a building that practically forms part of the infectious hospital, there is not only an impossibility of fully carrying out the practice, but a risk lest the very measure intended to protect the community from further invasion, might really be the means of promoting this. It is not, therefore, to be wondered at that the Sanitary Authority was led to abandon this essential feature of the plan known as the "Leicester system," and to substitute for it the generally adopted practice of maintaining infected families under supervision in their houses during the "quarantine period" of 16 days. Nor was this "home-quarantine," as it has been termed, as rigid as is sometimes attempted. The inmates of the houses were permitted and were even encouraged to go out daily, provided they did not mingle with other folk, and in some cases were allowed to continue at their work. This change in practice would, it might be thought, have given an opportunity of estimating the value of the strict quarantine system by affording a comparison between the two methods. The difficulties in arriving at any conclusions are, however, insuperable, for they demand a fuller knowledge of the genesis of every case than it is possible to obtain. The general impression left on my mind is that where the cases of small-pox were early notified, the one method is as efficacious as the other in limiting the spread of infection from house to house. So far as the subject can be dealt with statistically, I have attempted it in this report.

Another matter upon which the experience of an epidemic of small-pox in Leicester is of value, is that which forms the main object of this inquiry. In a community of which the child-population is largely unvaccinated, the occurrence of small-pox may be expected to throw some light upon the degree and extent of the influence of vaccination upon (1) the liability to attack, (2) the severity of attack, and (3) the mortality from the disease. On these points it may be remarked that the incidence, severity, and fatality in this outbreak were disproportionately high amongst children, even after deducting those who were directly infected at the hospital. The analysis of the vaccination conditions of the members of 193 invaded households, which has been attempted in this report, would seem to show that in this epidemic, at least, the natural liability to small-pox, unaffected by vaccination, was not so great as has been supposed. Thus of the 1,234 persons in this community, 33 were under 1 year of age, 328 aged 1 to 10 years, 538 aged 10 to 30 years, 331 aged 30 years and upwards, and of 9 the age is not mentioned. It will be seen in the text that of those under 1 year—the unvaccinated form 97 per cent.—the small-pox attacks 21·2 per cent. (all unvaccinated); of those aged 1 to 10 years—the unvaccinated form 74 per cent.—the small-pox attacks 28·9 per cent. (95·8 per cent. of those attacked being unvaccinated); of those aged 10 to 30 years—the unvaccinated form 15·5 per cent.—the small-pox attacks 28·1 per cent. (29·3 per cent. of those attacked being unvaccinated); of those aged 30 years and over—the unvaccinated form 2·7 per cent.—the small-pox attacks 20·5 per cent. (5·8 per cent. of those attacked being unvaccinated).

Having recently reported to the Royal Commission upon the outbreak of small-pox in the Dewsbury Union in 1891–92, I have thought that it might be instructive to contrast the main statistical results obtained in that inquiry with those gathered at Leicester. I have, therefore, compiled a few tables which form a supplementary note to the present report, whereby this comparison can be readily made. I may here premise that, except for the visitation of small-pox, there are but few points of similarity between these two centres. On the one hand, we have in Leicester a large Midland town with a population (in 1891) of upwards of 177,000 inhabitants, with a well-organised municipal government and thoroughly equipped sanitary organisation; whilst on the other there is in the Dewsbury Union a population of over 160,000 dwelling on an area three times as extensive as that of Leicester, and composed of 14 urban

sanitary districts each with its separate sanitary officials. Again, in Leicester, notification of infectious disease has long prevailed, and is thoroughly enforced; in the Dewsbury Union, at the time of the small-pox outbreak, it had either been only recently carried into effect or had not then been adopted. Lastly, the provision for isolation of infectious diseases—which, although inadequate in Leicester, yet sufficed to accommodate all the cases of small-pox—in the Dewsbury Union was such that only about two thirds of the cases had hospital isolation. The time over which the inquiry extended was the same in each, viz., 70 weeks, and the number of cases of small-pox during this period in 1892–93, in Leicester, was 357, whilst in the Dewsbury Union, in 1891–92, it amounted to 1,029. The death-rate amongst these cases was 5·8 per cent. in Leicester, 10·7 per cent. in the Dewsbury Union. But as regards the relative severity of attacks—apart from their fatality—there will be seen to be a close parallelism in the two series. Thus, in Leicester, the confluent (and malignant) type of small-pox form 26·8 per cent. of the whole number; in the Dewsbury Union, 26·5 per cent.; the coherent type was met with in 15·6 per cent. in Leicester, in 12·1 per cent. in the Dewsbury Union; the discrete type in 21·8 per cent. in Leicester, and 32·3 per cent. in the Dewsbury Union; and of the mild or varioloid type there were 35·5 per cent. in Leicester, and 27·5 per cent. in the Dewsbury Union.

It will, however, be seen that the incidence of the disease was greater upon children over one year of age in Leicester than in the Dewsbury Union. Thus, the proportion of infants under one year of age who were attacked was 1·7 per cent. of those attacked at all ages in Leicester; 2·8 per cent. in Dewsbury Union; but of those aged between 1 and 10 years the proportions were: Leicester, 28·8 per cent.; Dewsbury Union, 18·9 per cent. (or between ages 1 and 15 years, Leicester, 38·9 per cent.; Dewsbury Union, 29·4 per cent.). The proportion of those aged 10 to 30 years was 45·1 per cent. for Leicester, 54·4 per cent. for the Dewsbury Union, whilst the two series were nearly equal for the periods 30 years and upwards, viz., 24·3 per cent. for Leicester, 23·1 per cent. for the Dewsbury Union.

Although in consequence of the larger number attacked and the smaller total of deaths, the comparative mortality of those aged 1 to 10 years was less at Leicester (12·6 per cent.) than in the Dewsbury Union (19·4 per cent.), yet, relatively to the whole number of deaths from small-pox, 61·9 per cent. at Leicester occurred in subjects of this age-period, as compared with 34·5 per cent. in the Dewsbury Union.

The proportion of unvaccinated amongst those attacked with small-pox was higher in Leicester (viz., 43·1 per cent.) than in the Dewsbury Union (33·6 per cent.); but on the other hand the statistics of 193 households invaded by small-pox in Leicester show a proportion of 24·4 per cent. of unvaccinated amongst the members of these households who escaped attack; but in 544 such households in the Dewsbury Union the proportion was only 11 per cent. These returns enable one to calculate that in Leicester 39·4 per cent. of the unvaccinated indwellers of invaded houses were attacked with small-pox; in the Dewsbury Union, 55·7 per cent.

It will further be seen that in Leicester, 96·1 per cent. of those attacked between the ages of 1 and 10 years were unvaccinated; in the Dewsbury Union, 70·2 per cent.

It does not appear from these figures that the disproportion, in the extent of the disease in the two areas compared was due to spread of infection within households; for it is remarkable that the proportion of houses (*i.e.*, of those in which particulars of the inmates were obtained) yielding single cases of small-pox is almost the same; it was 65·8 per cent. in Leicester and 65·2 per cent. in the Dewsbury Union. This concordance is the more surprising since, not only was hospital isolation much more generally carried out in Leicester, but with far greater promptitude on the whole. The difference between the two outbreaks is mainly that of diffusion, and so far as it is permitted for an outside observer to judge, it might be said that the limitation of the spread of small-pox in Leicester was due, amongst other factors, to the readiness with which the cases were dealt with by the Sanitary Authority, through the energetic action of the medical officer and his staff.

In conclusion, I beg to offer my sincere thanks to the Medical Officer of Health, Dr. Priestley, for his invariable courtesy and the kindness with which he placed his time and information at my disposal. I have also to thank the chief sanitary inspector, Mr. Braley, for his assistance, and the chairman and members of the sanitary committee for the facilities afforded me in conducting the inquiry.

Report on the Outbreak of Small-pox at Leicester in 1892-93.

§1. *Population; Birth Rate; Death Rate.*

The population of Leicester at the census of 1891 was 177,353, and the estimated population for 1893 was 184,547. It should be stated, however, that in October 1891, the borough was enlarged by the addition of nine districts comprising an area of 5,504 acres (with an estimated population 38,680). By this extension of boundaries, the area of the borough was more than doubled, viz.:—from 3,030 to 8,534 acres. The density of the population in 1893 was therefore 21·6 persons per acre; in 1890, prior to the extension, it was "50 persons per acre"; but in parts "more than double this."

The annual birth-rate per 1000 of total population during each of the 19 years 1875 to 1893, has ranged between 42·09 in 1876, to 30·43 in 1890. In 1893 it was 32·5.

The annual death-rate during the same period has ranged between 26·02 in 1875, to 16·68 in 1889. In 1893 it was 19·6.

The infantile mortality is high. In these years the proportion per 1,000 deaths at all ages of those dying under one year of age has varied from 399·5 in 1889 to 331·1 in 1879. In 1893 this proportion was 365·04. The proportion of those dying under the age of five years has been as high as 581·6 in 1880, and as low as 451·2 in 1890. This proportion in 1893 was 487·4.

[*See* Table I., compiled from the Annual Reports of Medical Officer of Health, which abound in valuable statistics.]

TABLE I.

LEICESTER—POPULATION, BIRTHS and DEATHS (from REPORTS of MEDICAL OFFICER OF HEALTH.)

—	Estimated Population.	Births.		Deaths.		Deaths under 142 per 1,000 of Total Deaths.	Deaths under 5 years per 1,000 of Total Deaths.	Deaths in Public Institutions.	
		Total.	Per 1,000 of Population.	Total.	Per 1,000 of Population.			Total.	Per 1,000 of Total Deaths.
1875 - -	111,000	4,260	38·37	2,889	26·02	356·8	554·8	—	—
1876 - -	113,581	4,781	42·09	2,558	22·52	373·7	547·3	—	—
1877 - -	117,462	4,753	40·46	2,515	21·41	356·6	498·6	—	—
1878 - -	119,845	4,779	39·87	2,500	20·72	392·4	548·0	—	—
1879 - -	117,610	4,887	37·31	2,651	21·1	531·0	331·1	—	—
1880 - -	120,325	4,860	40·39	2,960	24·7	360·3	581·6	—	—
1881 - -	123,120	4,711	38·26	2,654	21·56	363·2	517·7	—	—
1882 - -	126,275	4,855	38·44	2,528	20·05	372·6	513·1	—	—
1883 - -	129,483	4,823	37·34	2,484	19·18	367·5	511·6	—	—
1884 - -	132,773	4,851	36·53	2,937	22·12	381·6	543·9	—	—
1885 - -	136,147	4,682	34·38	2,641	19·39	343·4	513·8	—	—
1886 - -	139,606	4,858	34·8	2,738	19·61	384·2	505·1	265	96·7
1887 - -	143,153	4,689	32·75	2,722	19·01	371·7	516·9	306	112·4
1888 - -	146,790	4,787	32·61	2,640	17·98	371·2	505·7	310	121·4
1889 - -	150,520	4,789	31·81	2,513	16·68	399·5	507·7	270	107·4
1890 - -	154,344	4,699	30·43	2,799	17·79	342·2	451·2	271	96·7
1891 - -	177,353	4,790	33·58	3,026	21·21	346·3	511·1	230	95·3
1892 - -	180,066	5,816	32·2	3,250	18·04	353·8	510·1	393	120·9
1893 - -	184,547	6,006	32·5	3,627	19·6	365·04	487·4	450	124·06

§2. *Zymotic Disease.*

In the accompanying series of Tables which I have prepared from the Annual Reports of the Medical Officers of Health, the mortality from zymotic diseases in Leicester since 1875 is given.

It will be seen (Table II.) that the comparative zymotic mortality has fluctuated during these years from a minimum of 98·2 per 1,000 of the total deaths from all causes in 1889, to a maximum of 263·1 in 1880, the years of greatest zymotic mortality being in order—1880, 1875, 1876, 1881, 1878, and those of lowest such mortality—1889, 1890, 1883, 1879, and 1877.

As regards individual diseases, *diarrhœa—the* scourge of Leicester— has with one exception (1879) been responsible for the largest proportion of this mortality in each year, In 1886 (*see* Table III.) the rate per 1,000 deaths from zymotic disease was for diarrhœa as much as from 651·4, and in 1890 it was 646·8. That this disorder has not diminished with the progress of sanitation is evident from these figures. Dividing the whole period into three terms of six years, we find the average proportion accruing to this disease, of the years 1875-80, 1881-86, 1887-92, to be 468, 500, and 491 respectively; the mortality for 1893 being considerably above this average.

TABLE II.

LEICESTER, 1875 to 1893.

DEATHS from ZYMOTIC DISEASE.

—	Small-Pox.	Measles.	Scarlet Fever.	Diph-theria.	Whooping Cough.	"Fever."			Diarrhœa.	Total.	Proportion of Deaths from Zymotic Disease to 1,000 of Total Deaths from all Causes.
						Typhus.	Enteric.	Continued.			
1875	—	49	175	7	91		64		308	694	240·2
1876	—	50	173	10	33		43		263	572	223·6
1877	6	40	33	9	65		20		185	358	142·3
1878	1	45	12	5	82		31		302	478	191·2
1879	—	72	105	11	61		21		88	358	135·0
1880	—	166	119	23	27		46		398	779	263·1
1881	2	7	184	11	122		29		193	548	206·4
1882	5	74	72	5	19		19		214	408	161·3
1883	3	15	91	6	59	—	10	—	148	332	132·8
1884	—	57	63	11	66	—	16	—	344	557	189·6
1885	—	52	113	14	52	—	36	—	186	453	171·5
1886	—	43	44	4	27	—	19	—	256	393	143·5
1887	—	87	5	13	55	—	31	—	247	478	175·6
1888	—	77	4	13	86	—	32	—	148	360	136·3
1889	—	62	6	10	26	—	22	—	121	247	98·2
1890	—	30	38	11	16	—	24	—	218	337	120·4
1891	—	84	17	14	136	—	29	—	204	484	159·9
1892	6	126	41	10	52	—	17	—	214	466	143·3
1893	15	52	81	20	42	—	47	—	399	656	180·8

TABLE III.

LEICESTER, 1875 to 1893.

PROPORTION of DEATHS from ZYMOTIC DISEASES.

Per 1,000 ZYMOTIC DEATHS.

—	Small-pox.	Measles.	Scarlet Fever.	Diph-theria.	Whooping Cough.	"Fever" Enteric mainly.	Diarrhœa.
1875	—	70·6	252·1	10·	131·1	92·2	443·8
1876	—	87·4	302·4	17·4	57·6	75·1	459·7
1877	16·8	111·7	92·1	25·1	181·5	55·8	516·7
1878	2·1	94·1	25·1	10·4	171·5	64·8	631·8
1879	—	201·1	293·3	30·7	170·3	58·6	245·7
1880	—	213·	152·7	29·5	34·6	59·0	519·9
1881	3·6	12·7	335·7	20·0	222·6	52·9	352·2
1882	12·2	181·3	176·4	12·2	46·5	46·5	524·5
1883	9·	45·1	274·	18·0	177·7	30·1	445·7
1884	—	102·3	113·1	19·7	118·5	28·7	617·4
1885	—	114·7	249·4	30·9	114·7	79·4	410·6
1886	—	109·4	111·9	10·1	68·6	48·3	651·4
1887	—	182·	10·4	27·2	115·0	64·8	516·7
1888	—	214·	11·1	36·1	238·8	88·8	411·1
1889	—	251·	24·3	40·4	105·2	89·1	491·1
1890	—	89·	112·7	32·6	47·4	71·2	646·8
1891	—	173·5	35·1	28·9	280·9	59·9	421·4
1892	12·8	270·0	87·9	21·4	111·6	36·4	459·4
1893	22·8	79·4	123·4	30·4	64·0	71·6	608·2

Next in order of importance as a cause of mortality during those years comes *scarlet fever*, the prevalence of which is naturally more variable. In the three years 1887 to 1889, there was only an average of three deaths annually from this disease; whereas in the three years 1879 to 1881 the annual average was 136. Again, comparing its mortality with that from all the zymotics it is seen that the rate per 1,000 of the latter was for scarlet fever, in each of the three sexennial periods named, 146, 212, and 46 respectively. In 1893 the mortality was 123·4.

In measles the deaths throughout the whole period closely approximate those from scarlet fever, but they are somewhat more evenly distributed. Again, taking the sexennial term, the average annual death-rate (per 1,000) zymotic deaths, for this disease would be 130, 92, and 180 respectively; these being as high a proportion as 270 in 1892. The rate in 1893 was below the average, viz. 79·4,

Lastly, as regards "*fever*," which practically means *enteric fever*, the mortality was highest in 1875, and next highest in 1885. The annual average for the three sexennial periods being 67, 47, and 68 per 1,000 of the total zymotic mortality. In 1893 it was 71·6.

Since 1879 Leicester has enjoyed the advantage of an act for the compulsory notification of infectious diseases, so that for nearly 15 years the statistics of certain of the zymotic diseases are more complete and furnish a better guide to their prevalence than mortality returns can do. In the Tables that follow (Tables IV., V., VI., VII.) figures based on these returns are given, first of the total numbers notified in each year, next of the proportion of cases of zymotic disease per million living, based on the population returns, and then of the relative proportion of cases of small-pox, scarlet fever, enteric fever, and diphtheria.

TABLE IV.

LEICESTER, 1879 to 1893.

CASES of ZYMOTIC DISEASE.

NOTIFICATIONS.

—	Small-pox.	Scarlet Fever.	Enteric Fever.	Diph-theria.	Erysi-pelas.	Puer-peral Fever.	Total.
1879*	—	496	56	24	125	—	701
1880	—	802	245	87	442	6	1,582
1881	5	1,065	179	63	566	15	1,893
1882	29	763	110	38	455	14	1,409
1883	12	797	85	26	317	12	1,249
1884	3	728	55	184	239	—	1,209
1885	8	1,816	216	55	294	8	2,397
1886	1	817	141	51	258	12	1,280
1887	9	272	222	81	308	6	898
1888	21	132	266	67	255	8	749
1889	—	409	147	84	219	1	860
1890	—	516	165	75	207	3	1,277
1891	—	794	178	65	238	2	966
1892	39	1,331	116	67	316	5	1,874
1893	281	2,308	392	139	353	10 Cholera 1	3,484

"The numbers in 1880, 1881, 1882, 1883 are *Certificates* only, and may not include quite all the cases."

* In this year the cases are only reckoned from September 13th to the end of 1879, this being the first day the Act came into effect.

LEICESTER.

Chart shewing Proportion of Cases of Infectious Diseases notified in the Years 1880 to 1893 inclusive, per 100·000 of Population, and the Proportion of Cases of Scarlet Fever, Enteric Fever, Small Pox and Diphtheria.

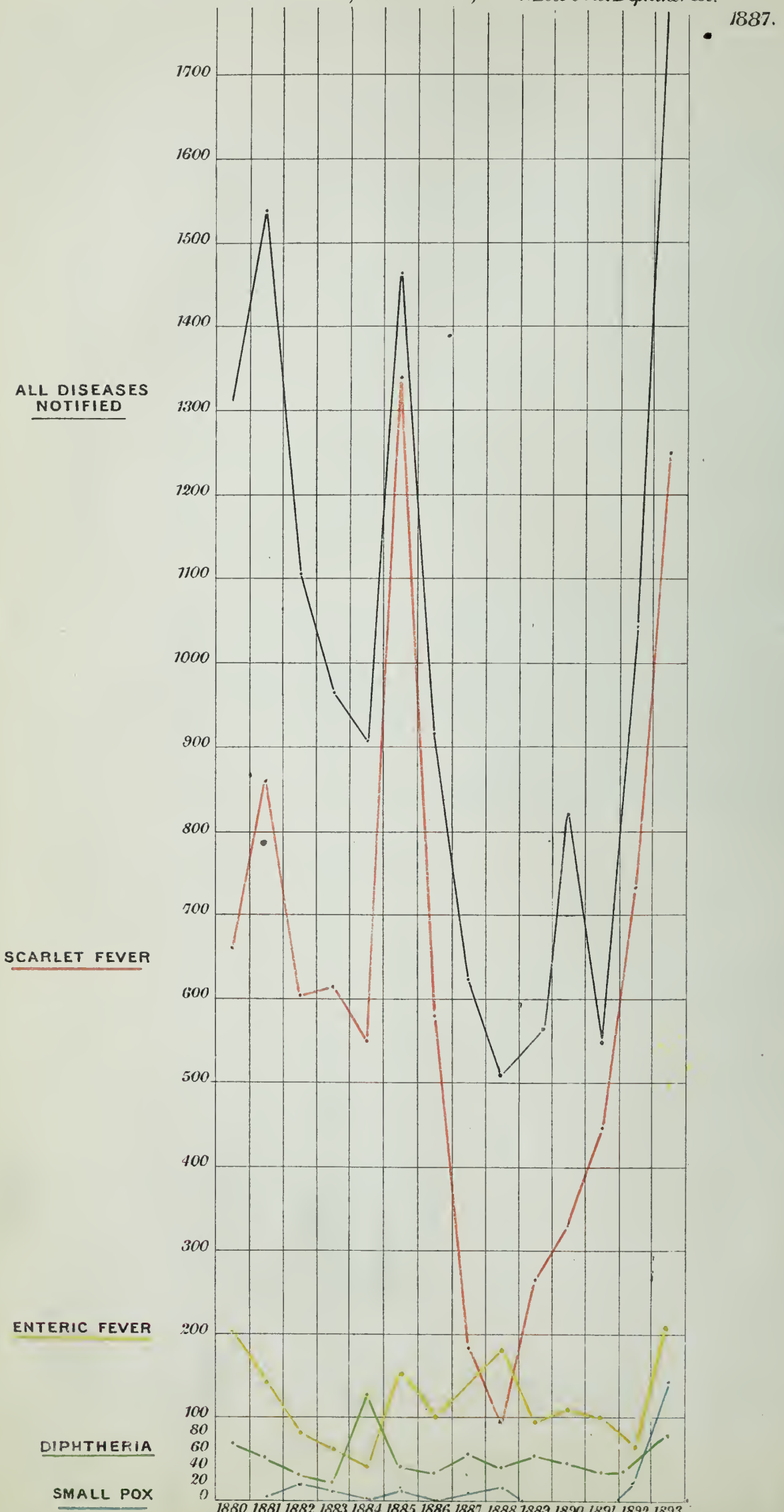

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TABLE V. (and CHART I.)*

LEICESTER, 1880–1893.

PROPORTION per MILLION Population of all Cases of ZYMOTIC DISEASE notified, and of certain such Diseases in particular.

—	Estimated Population.	Proportion of all Zymotics.	Proportion of			
			Small-pox.	Scarlet Fever.	Enteric Fever.	Diphtheria.
1880	120,325	13,147	—	6,582	2,036	723
1881	123,120	15,375	40	8,649	1,453	511
1882	126,275	11,158	229	6,042	870	300
1883	129,483	9,653	92	6,155	656	201
1884	132,773	9,104	22	5,483	414	1,810
1885	136,147	14,667	58	13,338	1,586	403
1886	139,606	9,171	7	5,852	1,009	365
1887	143,153	6,274	62	1,900	1,557	565
1888	146,790	5,102	143	919	1,810	456
1889	150,520	5,713	—	2,717	976	558
1890	154,344	8,228	—	3,336	1,069	485
1891	177,353	5,570	—	4,477	1,003	366
1892	180,066	10,407	216	7,391	644	366
1893	184,547	18,878	1,522	12,506	2,124	753

* *Explanation of Chart I.:—*
Chart showing the proportion of cases of certain of the zymotic diseases notified at Leicester per 100,000 *of the population, in the years* 1880 *to* 1893 *inclusive.*

TABLE VI.

LEICESTER, 1880–1893.

RELATIVE PROPORTION (per 1,000) of Cases of Small-pox, Scarlet Fever, Enteric Fever, and Diphtheria, notified to the Sanitary Authority in Leicester, 1880–1893.

—	Small-pox.	Scarlet Fever.	Enteric Fever.	Diphtheria.
1880	—	707	216	77
1881	3	812	137	48
1882	31	812	117	40
1883	13	867	92	28
1884	3	750	57	190
1885	4	867	103	26
1886	1	810	139	50
1887	15	467	380	138
1888	43	272	547	138
1889	—	639	230	131
1890	—	682	218	100
1891	—	765	172	63
1892	25	857	75	43
1893	90	740	125	45

TABLE VII.

LEICESTER, 1880–1893.

CASES of CERTAIN ZYMOTIC DISEASES, DEATHS and MORTALITY.

—	Small-Pox.			Scarlet Fever.			Enteric Fever.			Diphtheria.		
	Cases notified.	Deaths.	Mortality	Cases notified.	Deaths.	Rate.	Cases notified.	Deaths.	Rate.	Cases notified.	Deaths.	Rate.
			Per cent.			Per cent.			Per cent.			Per cent.
1880	—	—	—	802	119	14·8	245	46	18·5	87	23	26·4
1881	5	2	40·	1,065	184	17·2	179	29	16·2	63	11	17·4
1882	29	5	17·2	763	72	9·4	110	19	17·2	38	5	13·1
1883	12	3	25·	797	91	11·4	85	10	11·7	26	6	23·
1884	3	—	*nil.*	728	63	8·6	55	16	29·1	184	11	6·
1885	8	—	*nil.*	1,816	113	6·2	216	36	16·6	55	14	25·4
1886	1	—	*nil.*	817	44	5·3	141	19	13·4	51	4	7·9
1887	9	—	*nil.*	272	5	1·8	222	31	14·	81	13	16·
1888	21	—	*nil.*	132	4	3·0	266	32	12·	67	13	19·4
1889	—	—	—	409	6	1·4	147	22	15·	84	10	11·9
1890	—	—	—	516	38	7·3	165	24	14·5	75	11	14·6
1891	—	—	—	794	17	2·1	178	29	16·3	65	14	21·5
1892	39	6	15·3	1,331	41	3·0	116	17	14·6	67	10	15·
1893	281	15	5·3	2,308	81	3·5	392	47	12·	139	20	14·3

Owing to notification also the actual rate of mortality from each of the notified diseases is available, and it will be seen from the above table (Table) how this varies from year to year; the variations being most striking in the case of scarlet fever, and the rate more constant in enteric fever than diphtheria.

§3. *The Fever Hospital.*

The Borough Hospital for Infectious Diseases is situated on rising ground about 1½ miles from the Town Hall, to the north-west. When originally erected in 1870–71 it was well removed from inhabited dwellings, but within the past few years the district of Newfound Pool has been much built over. This district, formerly outside the borough, is now included within it; and one of its main roads runs from south to north—about 200 yards from the hospital site, separated by pasture land. On the other sides the hospital is fairly isolated—the Corporation owning some of the adjacent property, which is let in allotments—and a branch line of the Midland Railway runs through this land, skirting the grounds of the hospital.

In his report on the use and influence of hospitals for infectious diseases, Dr. Thorne gives a full description of this building which remains much the same as at his visit in 1881. I may, therefore, extract some of the passages from his report, which describe it better than I could do. He writes :—

" Owing to a prevalence of scarlet fever in Leicester in 1870 and 1871, and to the fear that small-pox, then

prevalent in several parts of the kingdom, might be imported into the borough, the Town Council determined in the latter year on the erection of some galvanised iron buildings to serve as a hospital for infectious diseases other than enteric fever, for which disease there is special provision in the fever house in connexion with the Leicester Infirmary. Tbes ite cbosen consisted of about two acres of Corporation property known as Freake's Ground, which is situated just outside and to the north-west of the borough. During the erection of the buildings, however, small-pox became widely epidemic in Leicester; and it was found necessary to use certain premises in Friars Road as a temporary hospital. Later on, also, additional buildings were erected on Freake's Ground and hospital tents were brought into use.

"The hospital on Freake's Ground is known as the Borough Fever Hospital. The soil on which it stands is clay. Close by are some brick works and also the town deposit for asbes and dry refuse.

"The buildings are enclosed by a wooden fence and consist of (1) one principal group of buildings arranged along the sides of a common corridor (2); a detached ward-pavilion, and (3) certain out-buildings, including the porter's lodge, a laundry, a disinfecting chamber, an ambulance shed containing an ambulance fitted with a movable stretcber, and a mortuary.

"The principal buildings are constructed of galvanised corrugated iron painted outside, and they are lined throughout with wood. They rest on brick piers and have slate roofs. The corridor, which runs the whole length of the building, is well ventilated by means of double-hung sash windows in its opposite sides. On each side of the corridor are three detached buildings. Then on one side are the administration block, and two blocks containing accommodation for nurses and stores; on tbe other side are three separate ward pavilions known as 'fever wards.' The administration block contains the principal entrance lobby, rooms for the matron, nurses, and servants, a kitchen and scullery, a surgery and store room.

* * * * * *

"Opening out from one end of the corridor above referred to are some additional wooden buildings, which were erected on account of the small-pox epidemic of 1871. One building is now used for stores, another for additional sleeping accommodation for nurses, and a third is a ward pavilion retained for small-pox cases. This pavilion consists of three wards *en suite* and is partly roofed with slate and partly with felt. It has one window at the extreme end, but throughout its entire length the only windows consist of sheets of glass let into the walls about eight feet above the floor level, and ten others fitted in frames so as to open. The roof is lowered and there are apertures for ventilation in the centre of the floor. About the middle of the building is a small ward kitchen, and at the side are waterclosets somewhat imperfectly separated from the wards.

* * * * * *

"There is accommodation for 28 small-pox patients in this pavilion and when it is in use a communication with the remainder of the buildings is cut off by means of a doorway at the end of the corridor referred to. By means, however, of a sliding panel in the door, food and other necessaries are passed from one part of tbe building to the other. I am informed that hitherto there has been no spread of infection, either from this pavilion to the fever wards or by means of the common corridor, from one of these latter wards to another.

"The detached pavilion is professedly reserved for cases of erysipelas. In point of construction it is very similar to the small-pox pavilion, but it is somewhat dilapidated, and, apart from two rooms at one end and which were constructed as nurse's rooms, it is not fit for the reception of the sick. Both this and the small-pox pavilion were originally coated with tar. Since then they have been whitewashed, but they remain very unattractive in appearance."

In the first (1885) of the series of admirable annual reports which were compiled by the late Medical Officer of Health, Dr. H. Tomkins, the following remarks on hospital accommodation appear:—

"Leicester has for some years been provided with a hospital, such as it is, for this purpose (*i.e.*, isolation of infectious diseases), but unfortunately it belongs to that class of structures which until the last few years has too often obtained in other towns. Intended at first as a more or less temporarv building, constructed hurriedly, and on an ill-designed plan, it may not inappropriately be termed an ugly makeshift. Having, however, been partly covered externally with corrugated iron, it has withstood the wear and tear of 12 or 13 years' use better than many others constructed entirely of wood. Erected originally to meet an outbreak of small-pox, it consists of five blocks, three containing one large ward each, and the other two only partially divided, and provides but unsatisfactory accommodation for the treatment of small numbers of patients, or for the convenient separation of such cases as may be desirable to isolate from others. It is also in many respects deficient in tbe accommodation and arrangements adopted in modern hospitals of this description."

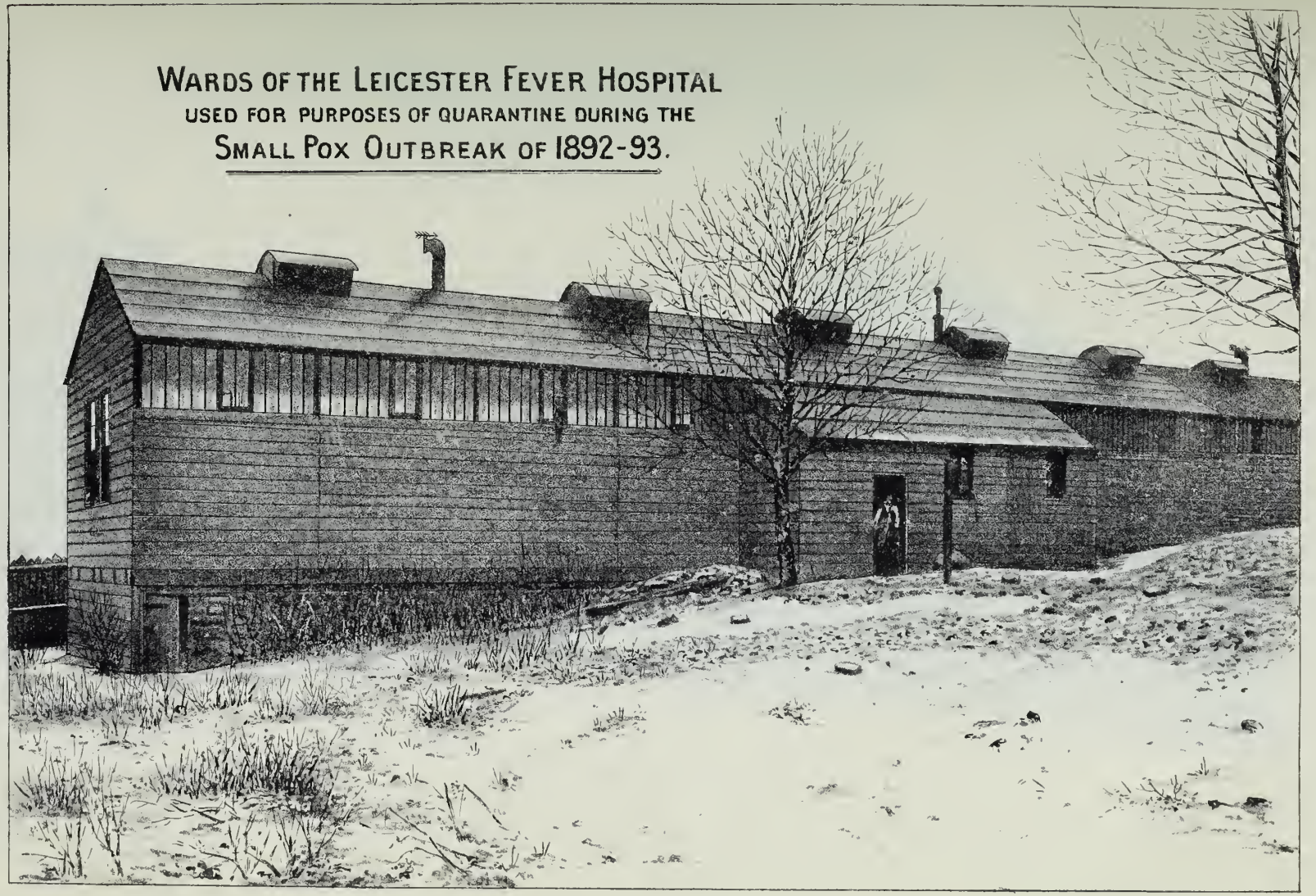
Nevertheless in spite of these inadequacies the building has been maintained in full working order—throughout the 20 years of its existence. The main portion—with three wards coming off the corridor on the right hand, and administration offices on the left—has been always set apart for the reception of cases of scarlet fever, when its original occupation by small-pox patients in 1872 was over; and from that time until the autumn of 1892 no small-pox case was admitted into those wards. These three wards are well kept, and lighted and commodious; and are equal to those of many similar institutions in the country. But the same cannot be said of the two large detached pavilions, which form the wings of the hospital. These buildings are constructed of wood, the roofs covered by felt, and they naturally show far more evidence of the exposure and wear of twenty years than the rest of the hospital. The ground on which they stand slopes downwards to the east and consequently tbey are constructed in portions at different levels coming close to the railway above mentioned. Although lofty and capacious, they are bare and comfortless; and are lighted by continuous windows at the eaves. Nor have they been in constant use. The northern wing has been set apart for the reception of cases of small-pox which have occurred from time to time, up to the present outbreak; and at other times, measles and other infectious diseases have been accommodated. The southern block, which is more widely separated from the main building—the laundry, disinfecting station, &c. intervening—is termed the "erysipelas" ward, but has been devoted to other purposes also, *e.g.*, the reception of fever convalescents, and of persons quarantined for small-pox, or for doubtful cases. Tbe accompanying illustration (*see* Plates I. and II.) from photographs taken at my request in January 1892, shows the nature of this building, and the state into which it has fallen. The interior is bare and is divided into three large wards,* all inter-communicating, one of which was set apart as a living room, and the others fitted up with beds when used for quarantine purposes. The sanitary accommodation is bad, and I am informed that the building is infested by rats. I cannot avoid expressing the opinion that these two wooden buildings are a reproach to the authorities, and that being clearly erected for a temporary purpose should long since have been replaced by more substantial structures.

In the autumn of 1892 an annex was built at the northern extremity of the corridor for the accommodation of the nursing staff, thus setting free some rooms which could be used as small wards.

Lastly, with the decline of the small-pox in 1893, it was resolved to re-open the wards to scarlet fever, and to erect a detached building in the north-eastern part of the site as a small-pox pavilion, a work which had just been completed when my visits ceased.

The use to which this hospital is put may be seen from the following return (Table VIII.) of the annual admissions since 1879 in comparison with the numbers notified in the borough. The vast majority have been cases of scarlet fever, of which disease 12,250 cases have occurred during the 14 years (1880 to 1893), and 5,560, or less than one half have been admitted. On the other hand, almost every case of small-pox notified has been isolated and a few cases admitted from outside the borough. It is noteworthy that, in 1893, when the hospital was closed to fever, more cases of that disease occurred in the borough than in any previous year in which notification has been in force.

* During the small-pox outbreak—when this building was being used for quarantine—the lower wards were improved by being divided by wooden partitions into smaller rooms capable of accommodating varying numbers of beds, and permitting of the separation of the sexes. At my last visit I found these partitions had been removed, it being intended henceforth to utilise the building for scarlet fever convalescents.



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WARDS OF THE LEICESTER FEVER HOSPITAL
USED FOR PURPOSES OF QUARANTINE DURING THE
SMALL POX OUTBREAK OF 1892-93.

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Table VIII.

Leicester Fever Hospital.

Table showing Number of Patients admitted since 1879, and the Number of Cases of Infectious Disease notified. in the Borough.

—	Small-pox.		Scarlet Fever.		Enteric Fever.		Erysipelas.		Admission of other Diseases.		Quarantine.	—
	Notified.	Admitted.	Notified.	Admitted.	Notified.	Notified.	Notified.	Admitted.	Measles.	Unclassified.		
1880	—	1	802	230	245	5	442	47	—	—	Prior to 1885 no record of numbers quarantined.	
1881	5	6	1,065	388	179	—	566	46	—	—		
1882	29	30	763	460	110	—	455	44	—	—		
1883	12	12	797	383	85	—	317	12	—	—		
1884	3	6	728	384	55	—	239	5	—	—		
1885	8	8	1,816	900	216	—	294	3	—	3	10	
1886	1	1	817	439	141	—	258	—	10	5	2	
1887	9	10	272	151	222	13	308	1	—	2	14[a]	[a] 2 developed small-pox.
1888	21	23	132	94	266	—	255	1	—	—	39[b]	[b] 3 developed small-pox.
1889	—	—	409	327	147	1	219	1	1	—	—	
1890	—	—	516	471	165	3	207	1	1	4[c]	—	[c] Varicella, 1.
1891	—	—	794	636	178	—	238	—	2	12[d]	—	[d] Varicella, 6
1892	39	38	1,331	727	116	—	316	—	6	4[e]	97[f]	[e] Varicella, 4. [f] 2 developed small-pox
1893	281	281	2,308	—	392	—	353	—	—	10	144[g]	[g] 14 developed small pox.

§4. Small-pox in Leicester—1852 to 1891.

From the reports of the medical officers of health, information respecting the mortality from small-pox is available for a period of 40 years. This I have reproduced below, and have appended an estimate of the total number of cases on the basis of a mortality of 10 per cent.

Table IX.

Deaths from Small-pox at Leicester, 1852 to 1891.

Year.	Estimated Population.	Small-pox Deaths.	Small-Pox, Estimated. (No. of Cases.)
1852	61,403	52	520
1853	62,164	11	110
1854	62,925	0	0
1855	63,686	0	0
1856	64,447	1	10
1857	65,208	17	170
1858	65,969	53	530
1859	66,730	3	30
1860	68,056	2	20
1861	68,257	1	10
1862	68,797	0	0
1863	72,130	5	50
1864	78,337	104	1,040
1865	80,500	10	100
1866	83,750	3	30
1867	86,000	2	20
1868	90,000	1	10
1869	91,500	0	0
1870	95,083	0	0
1871	97,500	12	120
1872	100,829	346	3,460
1873	102,515	2	20
1874	106,202	0	0
1875	111,000	0	0
1876	113,581	0	0
1877	117,461	6	60*
1878	121,473	1	10
1879	125,622	0	0
1880	120,325	0	0†
1881	123,120	2	5‡
1882	126,275	5	29
1883	129,485	3	12
1884	132,773	0	0
1885	136,147	0	8
1886	139,606	0	1
1887	143,153	0	7
1888	146,790	0	21
1889	150,520	0	0
1890	154,344	0	0
1891	177,353	0	0

* System of quarantine initiated. † Notification enforced.
‡ Actual number known.

In his report for 1883 Dr. W. Johnston, then Medical Officer of Health, points out that during the preceding seven years there had been no fewer than 17 importations of the disease, and he regards the continued exemption of the borough from any epidemic as being highly satisfactory, and "altogether due to the success which has hitherto "attended the efforts of the Health Committee in securing "not only the immediate reporting, but also the prompt "removal to hospital of all the cases as they came under "notice."

To this must be added the carrying out of a system of quarantining of those in contact with small-pox cases, which has formed a notable feature of the measures adopted in Leicester against the spread of small-pox. I propose, therefore to give a short account of the history of this system up to the present outbreak. In addition to published records, I have had the opportunity of conversing on the subject with the chairman of the Health Committee, Dr. Johnston, and Mr. Braley, to whom I tender my thanks for the information they freely gave me.

§5. Small-pox Quarantine in Leicester.

The first mention of the adoption of a system of quarantine for all persons who had been presumably in contact with a case of small-pox occurs in Dr. Johnston's Report for 1877; and it is to this gentleman that is due the credit of having introduced this safeguard as a routine measure.* In 1877, 12 cases of small-pox were registered (this was prior to the introduction of notification). Dr. Johnston writes:—

"As the plan which I adopted in the removal of these cases is novel, and may be found useful by officers of health in other towns for preventing the spread of the disease, I may be pardoned, if I again draw attention to it. In every house where a small-pox case occurred I endeavoured to impress the inmates with the fact that the removal of *all* the members of the family to the hospital was the best course to adopt, not only as regarded their own individual welfare, but also that of the town at large, and I am glad to say that all complied with my request, left their infected habitations, and became inmates of the hospital. Altogether 22 unaffected cases were thus admitted into quarantine, and of these 3 after admission sickened. The first case sickened in 48 hours, the second in 72 hours whilst the third showed no symptoms of the disease until the 12th day. . . . The suppression of what might otherwise have proved a widespread epidemic, attended with great fatality, was entirely due to the early information recorded of the cases affected, and the promptitude observed in their removal."

It was the custom, Dr. Johnston informed me, for the Corporation to pay the wages of the quarantined during their fortnight's detention; and they were allowed comparative freedom within the hospital grounds.

Nor was the removal to quarantine in all cases restricted to the members of an infected household; if it appeared that others had been in prolonged contact with the patient they also were persuaded to take this step.

* In his report for 1875 (p. 5), the late Dr. Crane, then medical officer, states that he removed to the hospital a child suffering from small-pox *together* with its parents. The child died, but the parents who had thus been practically "in quarantine" did not take the disease.

Hitherto there had been few objections on the part of individuals to go into quarantine; but in the few instances in which this had occurred, they were visited daily by the sanitary inspector and any signs of failing health reported to the Medical Officer. On one occasion Dr. Johnston succeeded in removing all the inmates of a lodging-house, 39 in number, two cases of small-pox having occurred in tramps who were dwelling there.* Again, in case of refusals, not only were the infected dwellings watched, but the employers of those who were engaged at work were informed of the fact that there was small-pox in the house. No more pressure was put on the folk than this, and it generally sufficed. Indeed, Mr. Braley informed me that he had never known a man lose his employment because of his detention in quarantine.

Although apparently, since the introduction of this system up to the present outbreak, there has been no instance of a quarantined inmate contracting small-pox at the hospital from proximity to the small-pox wards, it should be borne in mind that until 1892 the small-pox cases were confined to the special wing and not introduced into the main building. Mr. Braley recalled an instance in which the period of quarantine was too short, viz., only 12 days, and after the family returned home another member sickened, and the rest had all to undergo another fortnight's quarantine.

The part of the hospital buildings utilised for the purposes of quarantine has not invariably been the same. (*See* annexed Plan III.) In the first instance the large wooden building close to the entrance (south side) and farthest from the wards was utilised. It had since its erection been mainly devoted to cases of erysipelas, which used then to be admitted to the hospital, and was often spoken of as the "erysipelas ward," for it was then a single shed. It was subdivided into three large wards during Dr. Tomkins tenure of office, and apportioned by him to the reception of convalescent fever patients,† to which purpose it remained devoted until the present small-pox outbreak, when it has again been utilised for quarantine. In the meantime, two small wards at the north end of the building (marked 9, 10, in plan) opening into the corridor on the one hand and externally on the other, were set apart for quarantine; and have thus come to be known as the "quarantine wards" They are situated within a few yards of the north building (detached) used for the reception of cases of small-pox.

To show how seriously deficient is the accommodation in this hospital, it may be said that when not in use for quarantine these two rooms were occasionally utilised as a nurses' dormitory,‡ and that even when small-pox cases were in hospital, the nurses occupied two small rooms of the block apportioned to small-pox. The erection of an additional building for the nursing staff beyond this block was fortunately completed before small-pox became prevalent in 1892.

It has not been possible to get complete statistics of the numbers sent into quarantine since the system was initiated, but the returns for recent years have been kept.

	Cases of Small-pox admitted from Borough.	Numbers of Persons in Quarantine.
1877 - - -	12	22
1878 - - -	8	
1879 - - -	—	
1880 - - -	1	
1881 - - -	6	
1882 - - -	25	96?§
1883 - - -	9	
1884 - - -	3	
1885 - - -	8	10
1886 - - -	1	2
1887 - - -	9	14‖
1888 - - -	21	39¶
1890 - - -	—	
1891 - - -	—	
	103	183

If these figures are correct it is obvious that they cannot include all those who were exposed to the possibility of infection from the 103 cases of small-pox primarily admitted into hospital during these years.

The advantages of a quarantine system, if it could be practically enforced, are:—

(1.) The prevention of spread of disease by persons coming from infected houses.

(2.) The detection at the earliest possible moment of members of the family developing small-pox subsequent to the first case.

(3.) The facilities it affords for thorough disinfection and cleansing of the house vacated by the family.

But to be practically effectual this system not only requires the cordial co-operation of all concerned, but needs that the accommodation supplied by the authorities should be adequate and acceptable. So long as only a few cases of small-pox are present in a borough, it may be possible to meet these wants without entailing too much expense. But if the disease attain epidemic proportions the mere housing of all the families infected must entail the provision of adequate accommodation on a scale that few towns could furnish. Then, too, where as at Leicester the quarantine accommodation is of the barest, and the commingling of the quarantined in sleeping and dwelling rooms unavoidable, residence in quarantine for a fortnight might well be dreaded by self-respecting people.

On the other hand, if the system is to be carried out with efficiency and to be regarded by the people at large as a salutary provision, and one to which they ought to submit for the sake of the community, the town should see to it that the buildings provided for the purpose are of such a character as to supply comfort and privacy to every family.

In this regard Leeds* has advanced far beyond Leicester, for it has erected a considerable number of cottage dwellings for temporary occupation by the quarantined. Having had the opportunity of contrasting the provisions in the two towns, it has, I confess, been a matter of surprise to me that the Leicester people should have rested satisfied with the accommodation provided for them.

It is not surprising, then, that in 1893 it was found necessary to abandon the system of interning families in the hospital quarters, and to substitute for it the practice (which had always been adopted when persons referred to go to hospital quarantine) of daily inspection of infected houses, a practice which is customarily carried out in other towns during epidemics of small-pox. I am not prepared to say that with due vigilance this ordinary and obvious method may not be almost as efficacious for the purpose as that of hospital quarantine. It lacks, however, the advantage of the individuals living under constant medical supervision.

§6. *Procedure in dealing with Small-pox.*

In the case of a disease so highly contagious as is small-pox a great deal of the efficacy of the measures taken to deal with it must depend upon the promptitude and vigour with which they are carried out. I can fully testify that these qualities animate the Leicester sanitary authority in their treatment of small-pox. Upon the receipt of the notification, the ambulance is sent to convey the patient to hospital; and the chief sanitary inspector institutes inquiries as to the possible source of infection of the case. During the present outbreak I have been struck by the diligence with which the medical officer and chief sanitary inspector has thus prosecuted inquiries, with the result that I think fewer cases have been left "untraced" than often happens. The history of the patient during the previous fortnight is minutely inquired into; and in particular information is gathered as to those who may have been in contact with him or have visited the house since it became infected. This, it seems to me, is often a matter of difficulty; for it is hardly safe to assume that the dwelling has only been infected since the patient sickened. He may be (and indeed not infrequently is) the medium of infection of other members of the family through fomites in his clothing 12 or 14 days before he has any symptoms himself; and similarly he may convey the contagium to fellow-workers in a factory, to a school, or to persons with whom he has social or business relations. The risk of this is not so great obviously as is that of infection from himself direct; but here, too, it must be borne in mind that the pre-eruption period of the disease is an infection period, and the removal of a case as soon as its nature is determined, *i.e.*, when the rash is well out (about fourth or fifth day) will not prevent, although it may greatly diminish, the chances of further cases occurring in the household. It will be seen subsequently that a large proportion of the cases were removed early in the disease.

On removal of the case, and of the household (if sent to quarantine) the house is fumigated with sulphur; "liquid "disinfectants are used freely in the drains and about the "yard; and the ashpit is emptied and disinfected; the

* I was informed by Mr. Biggs (December 20, 1892), that originally the quarantine hospital block was only intended for tramps, &c.; and that families were taken in subsequently.

† As many as 100 children convalescent from scarlet fever have been lodged here at one time.

‡ These rooms have not, however, been used for this purpose during the tenure of office of the present matron *i.e.*, the past nine years.

§ I was informed by Mr. Biggs that from 1877 to 1885 inclusive there had been 128 persons quarantined, but there is no official record of the numbers in these years.

‖ Two developed small-pox and appear in that column also.

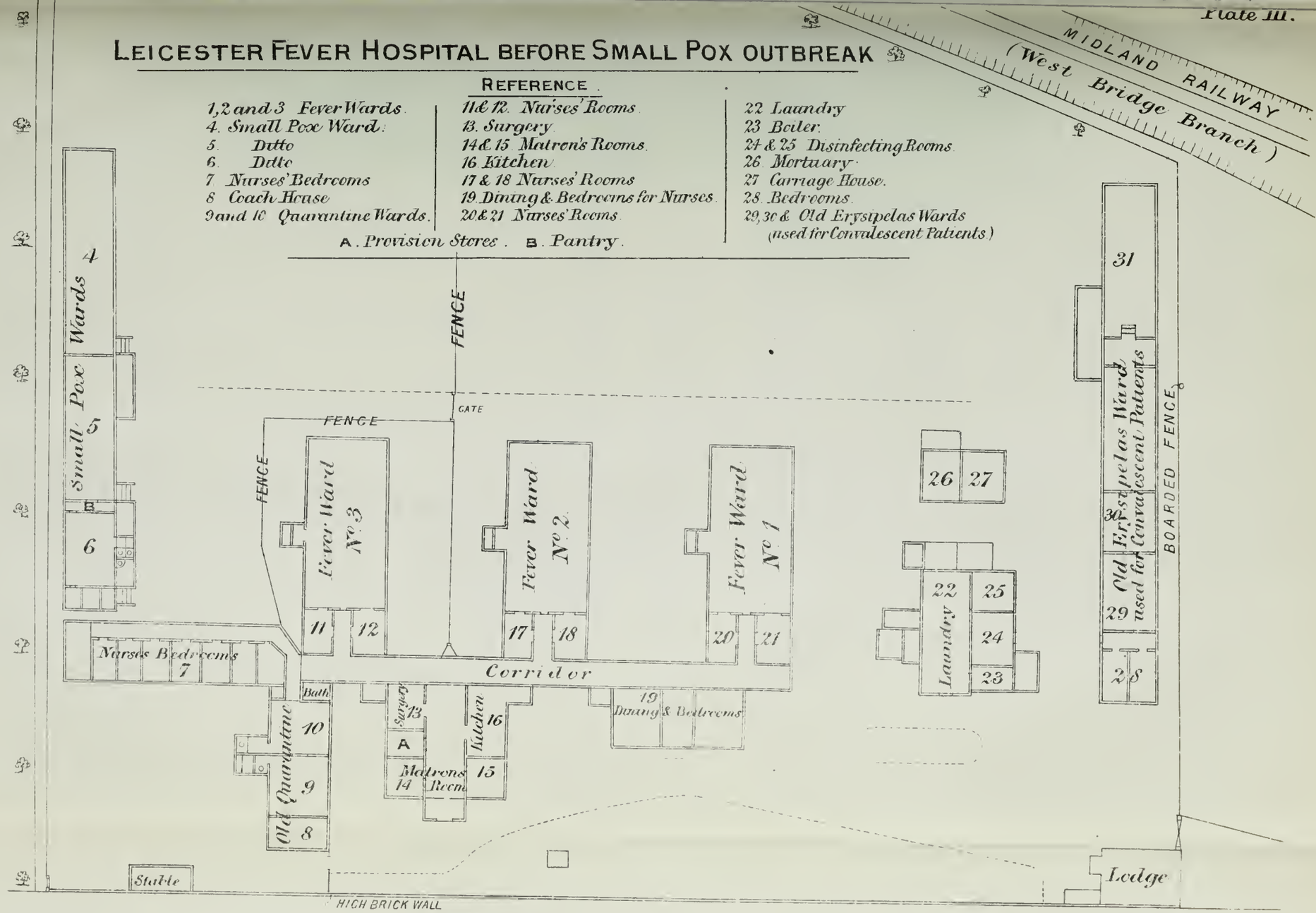
¶ Three developed small-pox and appear in that column also.

* At Glasgow, too, there is considerable provision for similar quarantine.

LEICESTER FEVER HOSPITAL BEFORE SMALL POX OUTBREAK

REFERENCE.

1,2 and 3 Fever Wards.
4. Small Pox Ward.
5. Ditto
6. Ditto
7. Nurses' Bedrooms
8 Coach House
9 and 10 Quarantine Wards.
11 & 12. Nurses' Rooms.
13. Surgery.
14 & 15 Matron's Rooms.
16 Kitchen.
17 & 18 Nurses' Rooms
19. Dining & Bedrooms for Nurses.
20 & 21 Nurses' Rooms.
22 Laundry
23 Boiler.
24 & 25 Disinfecting Rooms.
26. Mortuary.
27 Carriage House.
28. Bedrooms.
29, 30 & 31 Old Erysipelas Wards (used for Convalescent Patients.)
A. Provision Stores. B. Pantry.



Scale 40 feet to an inch.

E. G. Mawley C. E.
Boro: Surveyor
March 1893

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" next day the bedding is taken to the disinfecting chamber " and subjected to the hot air process."*

The disinfecting chamber was one of Ransome's, exchanged in 1888 for a more efficient steam disinfector by Goddard and Massey. It is erected on the hospital grounds.

Before leaving the hospital the patients have a final disinfecting bath, and their clothes are strongly disinfected.

§7. The Decline of Vaccination in Leicester.

I have not deemed it necessary to enter into any details concerning the history of vaccination in Leicester, as upon this subject abundant information has already been furnished to the Commission.

In view of the present outbreak it may, however, be of interest to quote the statements of Dr. Tomkins, late medical officer of health, in his annual report for the year 1887. He there writes (p. 72) :—

" For the past two years all compulsion or any attempt to carry out the vaccination laws has been abandoned, and thus not only those persons who have a disbelief in the protection afforded by this operation against an attack from small-pox, or have any other conscientious objection to it, are amongst the defaulters, but also large numbers of that numerous class who, from sheer carelessness and thoughtless ignorance, neglect to protect their children from this loathsome disease.

" It is only from about the year 1883 that any considerable number of children have been allowed to grow up in the town without being vaccinated. An instructive return was published last year by the Leicester Guardians, which showed that out of 33,659 children born from 1880 to 1886, both years inclusive, only 14,024 were known to have been vaccinated. It shows also that 4,765 had died unvaccinated, leaving a total of 14,870 who had not been submitted to that operation. Seeing, however, that the mortality of children under five years of age is in Leicester very high, it will not be over-estimating it to set down another 2,000 deaths as having occurred amongst these 14,870 unvaccinated children. It is to be noted also that 6,430 have accumulated during the last two years to which the report refers, *i.e.*, in 1885 and 1886. Speaking roughly from these dates, it may be assumed that there are from twelve to fourteen thousand unvaccinated children to-day within the borough, or some 10 to 12 per cent. of the entire population.* These particulars will be of interest, not only to the inhabitants of Leicester, but to the country at large, which is watching with some interest as to what may be the ultimate result of this wholesale neglect of vaccination. They will also serve to correct the exaggerated notions that prevail in some quarters, that by far the greater proportion of the inhabitants of Leicester are unvaccinated, whereas exactly the opposite condition is the fact. Should, however, the present state of things continue to go on, and 10 per cent. only of the children born are vaccinated, as happened last year, then in the course of eight or ten years from the present time, there will have accumulated a sufficient amount of 'inflammable material' to warrant the use of the term 'Leicester experiment' being applied to the town. Whether the present vigilant measures of isolation and quarantine will suffice to successfully deal with any outbreak of small-pox which may then arise, time only can prove. One thing is, however, certain, that any of these unprotected children have but to be brought in contact with a breath of infection from small-pox to almost invariably contract the disease."

Table X.

Return of Vaccinations in the Leicester Union.

Year.	Births Registered during Year.	Of the Children whose Births were Registered during the Year given in the First Column, by the 31st January in the Year next but one following that Year there were :—						
		Successfully Vaccinated.	Certified as Insusceptible of Vaccination.	Had Small-pox.	Died Unvaccinated.	Vaccination postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including Cases postponed) being per cent. of Births.
1872	4,154	3,422	6	16	574	136		3·3
1873	4,446	3,730	6	0	555	5	150	3·5
1874	4,365	3,590	9	0	643	19	104	2·8
1875	4,256	3,400	10	0	662	12	172	4·3
1876	4,773	3,650	9	1	679	27	407	9·1
1877	4,749	3,509	7	0	647	37	549	12·3
1878	4,777	3,260	4	0	707	108	698	16·9
1879	4,695	3,086	2	0	722	25	860	18·8
1880	4,860	3,010	5	0	816	14	1,015	21·2
1881	4,712	2,948	3	0	687	47	1,027	22·8
1882	4,855	2,660	7	0	720	36	1,432	30·2
1883	4,819	1,967	8	0	735	6	2,103	43·8
1884	4,849	1,700	9	1	818	24	2,297	47·9
1885	4,690	1,481	6	0	760	14	2,429	52·1
1886	4,864	655	2	0	847	3	3,357	69·1
1887	4,693	343	3	0	961	0	3,386	72·2
1888	4,805	220	0	0	885	0	3,700	77·0
1889	4,786	127	4	0	834	0	3,821	79·8
1890	4,697	118	0	0	882	1	3,696	78·7
1891	4,785	74	1	0	885	0	3,825	79·9
1892	5,816	132	0	0	1,024	0	4,660	80·1

It may be remarked that according to the returns furnished by the Medical Officers of Health the numbers vaccinated at the public stations have fallen of late years more rapidly than the private vaccination, the former being in 1887, 188 ; 1880, 80 ; 1889, 31 ; 1890, 12 ; 1891, 6.

§8. Small-pox at Leicester.

1892–93.

Early in the year 1892 a doubtful case of small-pox occurred in the town, but no other cases arose from it. The patient was, however, promptly isolated, and six inmates of the same house were removed to the hospital and detained in quarantine for a fortnight.

At the end of August a case was introduced into the town in the person of a tramp admitted into the Workhouse Infirmary. From that time for a period of 70 weeks—with one or two exceptions—cases continued to occur, *i.e.*, from the week ending August 24th, 1892, to the week ending December 27th, 1893.

The following account will be strictly confined to this period, and the cases considered include not only those that were duly notified, but also those cases that passed unrecognised at the time (most of whom never sought medical advise) but subsequently came to the knowledge of the authorities.

The total number of cases thus collected amounts to 357, of whom 181 were males and 176 females.

There were 21 deaths, a mortality of 5·8 per cent. ; but of the males there were only 7 deaths or 3·5 per cent. ; of the females, 14 deaths, or nearly 8 per cent.

In the following table a detailed list is given of these cases, which are recorded in the order of their onset, and appended is a record of the number of inmates of the houses whence they came arranged in four age-periods :—

* Statement by chief sanitary inspector quoted by Mr. Biggs in an article, "How Leicester deals with Small-pox." Reprint from "The Vaccination Inquirer," November 1, 1892.

* It will be seen subsequently that out of 1,234 inmates of 193 households invaded by small-pox in 1892-3, there were 361 children living below the age of ten years, and that 283 of these children were unvaccinated, a proportion of 23 per cent. of this limited population.—S.C.

Table of Cases of Small-pox.

Leicester, 1892–3.

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. Ref. No.	Households. Under 1 Year.	All Inmate 1 to 10.	All Inmate 10 to 30.	All Inmate 30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1	W. S.	M.	35	1892. Sept. 9	1892. —	1892. Aug. 24	1892. Aug. 24 W	1892. Aug. 30	Mild	Rec.	8 ?	Infancy: small smooth marks.	A tramp admitted to workhouse Aug. 24.	Not recognised	—	—	—	—	—
2	S. M.	F.	23	„ 9	Sept. 4	Sept. 8	Sept. 9	Oct. 22	Discrete	„	49	Infancy: 2 marks	Living at lodging-house where No. 1 went on Aug. 20.	- - - -	2	—	—	2	—
3	J. B.	F.	28	„ 10	„ 5	„ 7	„ 10	Nov. 3	Confluent	„	60	*Unvaccinated*	Do. do. do.	Dusky rash; high fever.	3	1	—	1	1
4	W. H.	M.	57	„ 12	—	„ 9	„ 10	Sept. 16	„	Died	8	Uncertain. (Had been in navy.)	Debilitated by tertiary syphilis. Occupied bed in ward at workhouse next to No. 1.	- - - -	—	—	—	—	—
5	E. B.	F.	9 months.	—	Sept. 27	„ 27	—	—	Mild	Rec.	?	"Under" vaccination	- - - - -	A doubtful case	3	—	—	—	—
6	E. J. K.	M.	35	Oct. 3	„ 28	Oct. 3	Oct. 3	Dec. 3	Confluent	„	67	Infancy: 4 marks	- - - - -	Onset and eruption severe, but arrest at maturation.	4	—	3	1	2
7	E. K.	F.	4	„ 19	Oct. 14	„ 15	„ 19	„ 10	Mild	„	58	"Under" vaccination, Oct. 4; 2 marks.	Sent to quarantine Oct. 3. Developed scarlet fever Oct. 11.	Rash at first mistaken for varicella.	4	—	—	—	—
8	P. J.	F.	21	„ 21	„ 12	„ 17	„ 21	„ 5	Confluent	„	38	Infancy: 4 foveate marks.	No. 5, taken charge of by Mrs. G. on its leaving quarantine, Sept. 19.	- - - -	5	—	—	1	2
9	E. R.	F.	24	„ 21	„ 17	„ 19	„ 20	„ 17	Confluent (with hæmorrhage).	„	62	*Unvaccinated*	Neighbour to No. 8, often nursed No. 5.	High fever; delirium	6	—	—	4	1
10	G. M.	M.	57	„ 25	„ 18	„ 21	„ 25	„ 24	Coherent	„	68	Infancy; 3 marks	Did not lie up at first - -	Iritis - - -	7	—	—	—	—
11	G. B.	M.	4	„ 31	„ 26	„ 27	„ 28	„ 19	„	„	55	*Unvaccinated*	Admitted for scarlet fever Oct. 7. Varicella Oct. 11; sent to special ward where No. 6 admitted on Oct. 15.	- - - -	—	—	—	—	—
12	E. L.	F.	3	Nov. 3	„ 26	„ 29	„ 31	Nov. 21	Malignant	Died	27	„	Admitted for scarlet fever Oct. 18 -	Adenitis - -	—	—	—	—	—
13	T. G.	M.	43	Oct. 29	„ 27	„ 29	„ 29	Dec. 24	Confluent	Rec.	59	Infancy: 3 marks	Employed in hospital attending to fires, &c.	- - - -	8	—	—	—	—
14	J. F.	M.	3	Nov. 3	„ 29	„ 31	„ 31	„ 18	„	Died	51	*Unvaccinated*	Admitted for scarlet fever Sept. 15. Varicella Oct. 10. Sent to special ward Oct. 12, where No. 6 admitted on 15th.	- - - -	—	—	—	—	—
15	F. B.	M.	7	„ 3	„ 29	Nov. 1	Nov. 1	1893. Feb. 9	„	Rec.	94	„	Admitted for scarlet fever Oct. 19 -	Adenitis - -	—	—	—	—	—
16	S. W.	F.	5	„ 3	„ 30	„	Oct. 31	1892. Dec. 10	Discrete	„	42	„	Admitted for scarlet fever Sept. 15. Varicella Oct. 6. No. 6 placed in same bed Oct. 15.	- - - -	—	—	—	—	—
17	M. A. J.	F.	45	„ 5	Nov. 2	„ 4	Nov. 4	Nov. 14	Confluent	Died	13	Infancy: 2 marks	Hospital laundress; intemperate; refused re-vaccination.	- - - -	9	—	—	1	2
18	M. S.	F.	35	„ 5	„ 3	„ 5	„ 5	Dec. 31	„	Rec.	59	„ 2 „	Aunt to No. 9, where she visited before removal.	- - - -	10	1	—	2	1
19	T. R.	M.	45	„ 6	„	„ 5	„ 5	1893. Jan. 14	„	„	73	„ 3 „	Same lodging-house as No. 10 -	Pleurisy; bronchitis -	7	—	—	—	—
20	N. H.	F.	7	„ 10	„ 3	„ 5	„ 9	1892. Dec. 17	Discrete	„	45	*Unvaccinated*	Scarlet fever followed by varicella. Left hospital 15th.	- - - -	11	—	1	2	2
21	H. C.	F.	7	„ 16	„ 10	„ 12	„ 14	Nov. 21	Confluent	Died	12	„	Admitted with scarlet fever Oct. 9 -	Hæmorrhagic rash; delirium.	—	—	—	—	—
22	W. W.	M.	49	„ 15	„ 12	„ 14	„ 14	1893. Jan. 9	Coherent	Rec.	59	„	- - - - -	- - - -	—	—	—	—	—
23	R. L.	M.	6	„ 18	„ 13	„ 16	„ 19	1892. Dec. 31	„	„	49	„	- - - - -	Conjunctivitis -	12	—	3	2	2

Table of Cases of Small-pox—*cont*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
24	J. H. J.	M.	21	1892. Nov. 19	1892. Nov. 14	1892. Nov. 16	1892. Nov. 18	1893. Jan. 7	Coherent	Rec.	54	Infancy : 3 marks	- - - - -	Gastritis Nov. 28	13	—	—	9	2
25	E. P.	M.	4	„ 23	„ 16	„ 20	„ 20	„ 7	Confluent	„	53	*Unvaccinated*	Admitted for scarlet fever Oct. 28	Abscesses	—	—	—	—	—
26	F. H.	M.	8	„ 23	„ 18	„ 21	„ 23	„ 21	„	„	65	„	- - - - -	Keratitis; tonsillitis	14	—	3	3	2
27	W. Y.	M.	30	„ 25	„ 19	„ 23	„ 24	1892. Dec. 15	Mild	„	27	Infancy : 3 marks	- - - - -	Some doubt as to this being varicella	15	—	1	1	1
28	L. D.	F.	9	„ 26	„ 23	„ 25	„ 26	1893. Jan. 28	Confluent	„	67	*Unvaccinated*	Admitted for scarlet fever Oct. 27. Sent home Nov. 27.	Delirium; dusky rash	16	—	4	2	2
29	M. R.	F.	4	Dec. 4	„ 29	Dec. 1	Dec. 3	„ 28	„	„	62	„	Admitted for scarlet fever Oct. 28. Sent home Nov. 15.	- - - -	17	1	2	2	2
30	A. J.	M.	7	„ 7	Dec. 2	„ 4	„ 6	1892. Dec. 15	„	Died	14	„	Admitted for scarlet fever Oct. 19. Sent home Nov. 29.	Laryngitis; broncho-pneumonia.	18	1	3	4	2
31	C. H.	M.	7	„ 9	„ 4	„ 5	„ 6	1893. Jan. 21	Discrete	Rec.	49	„	Brother to 26. Quarantine Nov, 23	Albuminuria	14	—	—	—	—
32	K. L.	F.	33	„ 10	„ 7	„ 9	„ 10	„ 7	„	„	32	Infancy : 3 marks	Mother to No. 23. Quarantine Nov. 19 to Dec. 1.	Swollen breast	12	—	—	—	—
33	W. J. S.	M.	13	„ 21	„ 10	„ 16	„ 21	Feb. 20	Confluent	„	73	*Unvaccinated*	- - - - -	Large pustules; abscesses.	19	—	2	2	2
34	H. J.	M.	8	„ 19	„ 11	„ 13	„ 17	„ 23	„	„	75	„	- - - - -	Delirium; abscesses	20	—	6	5	2
35	W. C.	M.	30	„ 16	„ 12	„ 15	„ 15	Jan. 10	Coherent	„	30	Infancy : 2 marks	- - - - -	- - - -	—	—	—	—	—
36	W. R.	M.	36	„ 17	„ 12	„ 14	„ 17	„ 5	Mild	„	25	„ 3 „	- - - - -	- - - -	17	—	—	—	—
37	E. P.	F.	25	„ 17	„ 15	„ 17	„ 15	„ 4	„	„	21	„ 3 „	Re-vaccinated (2 insertions) Dec. 15, 1892. Hospital nurse.	Eruption aborted	—	—	—	—	—
38	A. J. P.	M.	35	—	„ 15	„ 17	—	1892. Dec. 26	Discrete	„	12	„ ? „	Not notified - - - -	- - - -	21	—	4	4	2
39	— L.	M.	1	1893. Jan. 2	„ 15	„ 15	—		Coherent	„	—	*Unvaccinated*	- - - - -	- - -	22	—	2	3	2
40	E. M.	F.	18	1892. Dec. 26	„ 20	„ 22	Dec. 24	1893. Jan. 28	Mild	„	40	Infancy : 3 marks	- - - - -	Menorrhagia	23	—	—	2	3
41	A. W.	F.	24	1893. Jan. 25	„ 23	?	Jan. 25	Feb. 4	„	„	44	„ 2 „	- - - - -	- - - -	24	—	2	2	—
42	F. S.	F.	22	1892. Dec. 30	„ 24	Dec. 26	„ 28	„ 28	Discrete	„	36	„ 2 „	- - - - -	- - - -	25	—	1	3	—
43	G. L.	M.	4	1893. Jan. 1	„ 30	1893. Jan. 2	„ 2	„ 23	Coherent	„	56	*Unvaccinated*	Admission into Children's Hospital with convulsions, Jan. 1.	Abscesses	22	—	—	—	—
44	A. M. S.	F.	7	„ 3	„ 31	„ 2	„ 2	Jan. 16	Mild	„	17	Infancy : 4 marks	- - - - -	"Doubtful" case	19	—	—	—	—
45	N. H.	F.	12	„ 14	„ 31	„ 2	„ 12	Feb. 15	„	„	47	*Unvaccinated*	? Contracted from No.	Slight fever; tonsillitis.	26	—	2	5	2
46	O. G.	M.	24	„ 5	„ 31	„ 2	„ 3	Jan. 30	„	„	31	Infancy : 2 marks	Contracted at Halifax	- - - -	27	—	3	4	2
47	F. L.	M.	25	„ 5	„ 31	„ 3	„ 5	March 11	Confluent	„	70	„ 3 „	Contracted at Chesterfield	Severe, but abortive	28	—	1	1	2
48	W. L.	M.	28	„ 6	1893. Jan. 1	„ 4	„ 5	Feb. 4	Mild	„	35	„ 2 „	- - - - -	Slight fever	22	—	—	—	—
49	A. B.	M.	15	„ 6	„ 1	„	„ 8	„ 4	„	„	35	„ 3 „	- - - - -	Tonsillitis	29	—	—	4	2
50	E. H.	F.	21	„ 9	„ 2	„ 5	„ 7	Jan. 28	„	„	27	„ 3 „	- - - - -	No secondary fever	30	—	3	6	1
51	C. M.	F.	15	„ 5	„ 3	„ 5	„ 5	„ 28	„	„	26	„ ? „	Had slept with sister, No. 40, Dec. 19. Sent to quarantine Dec. 28.	- - - -	23	—	—	—	—

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
52	E. M.	F.	36	1893. Jan. 8	1893. Jan. 3	1893. Jan. 7	1893. Jan. 8	1893. Feb. 1	Mild	Rec.	30	Infancy: ? marks	Had slept with sister, No. 40, Dec. 19. Sent to quarantine Dec. 28.		28	—	—	—	—
53	B. P.	F.	8	„ 9	„ 3	„ 5	„ 11	March 29	Confluent	„	86	*Unvaccinated*	Infected by No. 38	Abscesses	21	—	—	—	—
54	J. B.	F.	8	„ 8	„ 3	„ 6	„ 8	„ 29	„	„	86	„		Semi-malignant; hæmorrhage; high fever.	31	—	1	1	4
55	F. T.	M.	10	„ 23	„ 3	„ 5	„ 23	„ 11	Discrete	„	68	„	Not recognised at first		32	—	2	4	2
56	E. A.	M.	10	„ 7	„ 4	„ 6	„ 7	Feb. 23	„	„	51	„		Large pustules	33	—	1	2	1
57	A. P.	F.	13	„ 8	„ 4	„ 6	„ 8	„ 1	Mild	„	29	Infancy: 2 marks	Had nursed No. 43 when eruption on him.		34	—	3	3	2
58	J. M.	M.	19	„ 13	„ 4	„ 6	„ 13	„ 4	„	„	32	„ 4 „	About with rash out		35	—	—	6	2
59	J. S.	M.	5	„ 6	„ 4	„ 6	„ 6	March 15	Confluent	„	71	*Unvaccinated*		Nephritis; dropsy; tonsillitis.	19	—	—	—	—
60	E. M.	F.	28	„ 6	„ 5	„ 7	„ 8	Jan. 23	Mild	„	19	Infancy: 5 marks	Re-infected (*vide* No. 111)	No pyrexia; miscarriage.	36	—	4	1	1
61	E. P.	F.	5	„ 9	„ 5	„ 7	„ 10	Jan. 20	Confluent	Died	16	*Unvaccinated*	Infected by No. 38	Hæmorrhages. Double panopthalmitis.	21	—	—	—	—
62	B. K.	F.	26	„ 9	„ 5	„ 8	„ 8	Feb. 8	Mild	Rec.	32	Infancy: 4 marks	Wife of keeper of common lodging-house.		—	—	—	—	—
63	V. G.	F.	22	„ 11	„ 5	—	—	—	Discrete	„	—	„	Infected by No. 38		37	—	—	5	2
64	E. H.	F.	14	„ 13	„ 6	Jan. 9	Jan. 12	March 8	Confluent	„	62	*Unvaccinated*			26	—	—	—	—
65	C. W.	M.	1½	„ 25	„ 6	„ 10	„ 25	Feb. 4	Mild	„	30	„	Not attended by medical man		24	—	—	—	—
66	M. V.	F.	20	„ 10	„ 7	„ 9	„ 8	March 16	Discrete	„	69	Infancy: 4 marks	Wardmaid at hospital. Refused re-vaccination.		—	—	—	—	—
67	A. W.	F.	20	„ 11	„ 7	„ 9	„ 11	Feb. 1	Mild	„	26	„ 4 „	Infected by No. 38		21	—	—	—	—
68	F. F.	M.	29	„ 18	„ 7	„ 9	„ 18	„ 11	„	„	36	„ 2 „	Came from workhouse		—	—	—	—	—
69	J. W.	M.	13	„ 13	„ 7	„ 11	„ 13	March 11	Confluent	„	64	*Unvaccinated*			38	—	3	3	2
70	G. L.	M.	23	„ 10	„ 8	„ 9	„ 10	Feb. 25	Coherent	„	49	Infancy: 4 marks		Tonsillitis; phlebitis	39	—	—	4	—
71	J. W.	M.	5	„ 11	„ 8	„ 10	„ 11	March 3	„	„	55	*Unvaccinated*		Slight delirium	40	—	3	1	1
72	J. J. J.	M.	8	„ 29	„ 9	„ 11	„ 31	Feb. 15	Discrete	„	38	„	Not recognised when sent to quarantine, 28th Jan.; had stains of recent rash. Brother to No. 104.		41	—	3	3	1
73	S. C.	M.	5	„ 12	„ 9	„ 10	„ 12	March 8	Coherent	„	59	„		Abscess; slight fever	42	—	4	—	3
74	E. B.	F.	17	„ 14	„ 9	„ 12	„ 15	Feb. 1	Mild	„	24]	Infancy: 3 marks			43	—	4	5	2
75	T. H.	M.	21	„ 23	„ 9	?	—	—	Discrete	„	—	„ 3 „	Treated at home. Not discovered for 3 weeks.		44	—	1	6	2
76	G. H.	M.	26	„ 13	„ 9	„ 11	Jan. 13	Feb. 4	Mild	„	27	„ 4 „			45	1	2	2	1
77	M. J.	F.	13	Feb. 5	„ 10	„ 12	—	—	Discrete	„	—	*Unvaccinated*	Not notified at first. Inoculated at home. Home under observation till December 31.		20	—	—	—	—

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
78	G. S.	M.	50	1893. Jan. 18	1893. Jan. 12	1893. Jan. 14	1893. Jan. 18	1893. Feb. 4	Mild	Rec.	27	Infancy: 3 marks	Had maturated before admission	—	—	—	—	—	—
79	W. P. P.	M.	30	„ 13	„ 12	—	—	—	„	„	—	—	—	—	46	—	1	3	1
80	G. G.	M.	44	„ 18	„ 13	„ 15	Jan. 17	Feb. 20	„	„	39	Infancy: 3 marks	—	Spots fading 19 Jan.	47	—	—	—	—
81	A. B.	F.	24	„ 18	„ 15	„ 17	„ 18	„ 18	„	„	35	„ 4	Re-vaccinated unsuccessfully Jan. 9	About 6 papules	29	—	—	—	—
82	R. H.	F.	5	„ 18	„ 16	„ 18	„ 18	March 8	Coherent	„	52	*Unvaccinated*	Sent to quarantine 12th Jan.	—	26	—	—	—	—
83	C. M.	M.	20	„ 22	„ 16	„ 18	„ 22	Feb. 20	Mild	„	36	Infancy: 5 marks	—	—	48	—	—	2	1
84	H. M.	F.	30	„ 20	„ 17	„ 19	„ 19	March 8	Coherent	„	51	„ 6 „	Sister to F. L., No. 47	Severe, but did not pustulate.	28	—	—	—	—
85	E. H.	F.	10	„ 18	„ 17	„ 19	„ 20	Feb. 23	„	„	38	*Unvaccinated*	Sent to quarantine 12th Jan.	—	26	—	—	—	—
86	R. H.	M.	20	„ 23	„ 17	„ 19	„ 23	„ 23	Discrete	„	38	Infancy: 3 marks	—	Developed scarlet fever, 26th Jan.	49	—	1	6	2
87	A. H.	F.	17	„ 18	„ 17	„ 19	„ 19	March 8	Coherent	„	51	*Unvaccinated*	Sent to quarantine 12th Jan.	Large bullæ	26	—	—	—	—
88	L. C.	M.	8	„ 25	„ 17	„ 19	„ 24	April 15	Confluent	„	89	„	—	Delirium; abscesses	50	—	3	3	2
89	H. A.	M.	7	„ 20	„ 18	„ 20	„ 20	„ 29	Coherent	„	102	„	Desquamating (scarlet fever) on admission.	Slight delirium	33	—	—	—	—
90	G. R. T.	M.	21	„ 23	„ 18	„ 20	„ 23	Feb. 11	Mild	„	25	Infancy: 2 marks	Infected by brother, No. 55	—	32	—	—	—	—
91	M. T.	F.	16	„ 23	„ 18	„ 20	„ 23	April 20	Mild	„	102	„ 2 marks	Infected by No. 55	Mammary abscess	32	—	—	—	—
92	S. M.	M.	52	„ 22	„ 19	„ 21	„ 22	March 11	Coherent	„	52	„ 6 „	Infected by No. 51. In quarantine 5th to 12th Jan.	—	23	—	—	—	—
93	N. T.	M.	4	„ 23	„ 19	„ 21	„ 23	April 20	Confluent	„	72	*Unvaccinated*	Infected by brother, No. 55	—	32	—	—	—	—
94	M. N.	F.	41	„ 21	„ 19	„ 21	„ 21	March 8	Discrete (severe)	„	49	Infancy: 3 marks	Attended on Nos. 53, 57, 61	Marked eruption; course mild.	21	—	—	—	—
95	A. H.	F.	9 months.	„ 21	„ 19	—	—	Jan. 20	Malignant	Died	2	*Unvaccinated*	Died after 24 hours' attack	—	51	1	—	3	—
96	E. W.	M.	2½	„ 25	„ 20	„ 23	„ 25	May 2	Confluent	Rec.	103	„	—	Very severe	24	—	—	—	—
97	E. B.	F.	7	„ 21	„ 20	„ 21	„ 21	Feb. 23	Mild	„	35	„	—	—	52	1	3	3	2
98	J. W.	M.	28	„ 25	„ 20	„ 22	„ 25	„ 11	„	„	23	Infancy: 5 marks	Infected by his child, No. 65	—	24	—	—	—	—
99	W. J.	M.	61	„ 27	„ 21	„ 23	„ 27	„ 20	„	„	31	„ 6 „ Re-vaccinated 1852.	—	About six papules	—	—	—	—	—
100	A. W.	M.	17	„ 25	„ 22	„ 24	„ 25	March 11	„	„	49	Infancy: 4 marks	—	—	53	—	1	4	2
101	L. T.	F.	7	„ 24	„ 22	„ 24	„ 24	April 20	Discrete	„	89	*Unvaccinated*	Sister to No. 93	Slight fever	32	—	—	—	—
102	C. B.	M.	31	„ 25	„ 22	„ 24	„ 25	Feb. 22	Mild	„	32	Infancy: 4 marks. Revaccinated 1885.	—	Rapid subsidence	54	—	4	2	1
103	J. P.	M.	33	„ 26	„ 22	„ 24	„ 25	March 11	Coherent	„	49	Infancy: 3 marks	—	Slight fever; conjunctivitis; iritis.	55	1	2	1	1
104	C. J.	F.	5	„ 29	„ 23	„ 25	„ 28	April 6	Discrete	„	74	*Unvaccinated*	Sister to 72	Sloughing phenyitis	41	—	—	—	—
105	A. G.	F.	12	„ 26	„ 23	„ 25	„ 26	March 15	Confluent	„	52	„	—	Hæmatemesis; epistaxis; fever.	56	—	—	1	1

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
106	E. W.	F.	40	1893. Jan. 28	1893. Jan. 23	1893. Jan. 25	1893. Jan. 25	1893. Feb. 22	Mild	Rec.	31	Infancy: 3 marks. Re-vaccinated ten years ago.	Nursed No. 60 at hospital	. . . .	—	—	—	—	—
107	T. H. W.	M.	21	„ 28	„ 26	„ 28	„ 28	„ 20	„	„	26	Infancy: 3 marks	. . . . .	. . . .	—	—	—	—	—
108	A. P.	F.	14	„ 30	„ 27	„ 29	Feb. 1	March 15	„	„	48	„ 4 „	. . . . .	Complicated with otorrhea and symptoms of meningitis.	57	—	—	3	2
109	J. S.	M.	70	Feb. 4	„ 28	Feb. 1	„ 3	April 4	„	„	67	„ 4 „	. . . . .	Bronchitis	58	—	2	2	2
110	F. E, H.	F.	4	„ 3	„ 28	Jan. 31	„ 3	Feb. 8	Confluent	Died	12	*Unvaccinated*	. . . . .	Panopthalmitis	59	1	2	1	1
111	E. M.	F.	28	Jan. 30	„ 28	„ 30	Jan. 30	March 2	Discrete	Rec.	34	Infancy: 5 marks	No. 60 re-admitted	Well matured pustules on face.	36	—	—	—	—
112	J. R.	M.	29	„ 30	„ 28	„ 30	„ 30	„ 23	Confluent	„	55	„ 2 marks	. . . . .	Alcobolic; erysipelas	—	—	—	—	—
113	A. P.	F.	24	Feb. 2	„ 29	Feb. 1	Feb. 1	„ 4	Mild	„	33	„ 2 „	. . . . .	. . . .	60	1	7	8	3
114	N. J.	M.	5	„ 5	„ 30	„ 1	„ 4	„ 9	Confluent	Died	9	*Unvaccinated*	. . . . .	Dusky red rash	20	—	—	—	—
115	A. W.	F.	22	„ 9	„ 31	„ 2	„ 4	March 29	Discrete	Rec.	56	Infancy: 2 marks	. . . . .	. . . .	61	—	—	2	—
116	W. K.	M.	28	„ 4	„ 31	„ 2	„ 4	„ 4	Mild	„	31	„ 3 „	Engaged on work at hospital 14th April.	Tonsillitis 7th Feb.	62	—	1	2	—
117	J. P.	M.	50	„ 4	„ 31	„ 2	„ 4	„ 11	Discrete	„	38	„ 4 „	. . . . .	Rash abundant on face and throat.	64	—	—	5	1
118	H. B.	M.	25	„ 4	Feb. 1	„ 3	„ 4	„ 4	Mild	„	30	Infancy: Re-vaccinated 2 years ago.	. . . . .	About six papules	—	—	—	—	—
119	M. C.	M.	16	„ 4	„ 2	„ 4	„ 4	Feb. 25	„	„	22	Infancy: 4 marks	Infected by No. 88	. . . .	50	—	—	—	—
120	J. B.	M.	30	„ 9	„ 3	„ 6	„ 8	March 4	„	„	27	„ 5 „	. . . . .	. . . .	63	1	2	1	1
121	B. G.	M.	7	„ 14	„ 4	„ 7	„ 11	April 27	Confluent	„	83	*Unvaccinated*	. . . . .	Abscesses	65	—	4	1	2
122	E. J.	F.	4	„ 8	„ 4	„ 6	„ 7	„ 27	Coherent	„	83	„	. . . . .	„	20	—	—	—	—
123	E. J.	M.	15	„ 8	„ 4	„ 6	„ 7	„ 6	„	„	62	„	. . . . .	„	20	—	—	—	—
124	L. C.	M.	35	„ 6	„ 4	„ 6	„ 6	Feb. 25	Mild	„	23	Infancy: 1 mark	Father to 88 and 119	. . . .	50	—	—	—	—
125	A. L.	M.	48	„ 10	„ 6	„ 8	„ 9	March 4	„	„	27	„ : 2 marks	. . . . .	Bronchitis	—	—	—	—	—
126	H. S.	F.	21	„ 11	„ 9	„ 11	„ 11	„ 2	„	„	22	„ : 5 „	Infected by 104	. . . .	41	—	—	—	—
127	M. S.	F.	33	„ 17	„ 11	„ 13	„ 17	„ 15	Discrete	„	33	„ : 6 „	From Mansfield 11th Feb.	. . . .	66	—	1	1	4
128	M. E. J.	F.	6	„ 17	„ 12	„ 14	„ 16	„ 29	Coherent	„	46	*Unvaccinated*	. . . . .	Abscesses	20	—	—	—	—
129	W. B.	M.	7	„ 17	„ 12	„ 14	„ 16	April 6	Confluent	„	53	„	? Infected in Sunday school	„	67	—	4	1	2
130	A. H.	F.	26	„ 18	„ 16	„ 18	„ 18	March 15	Mild	„	28	Infancy: 3 marks	. . . . .	Tonsillitis	59	—	—	—	—
131	N. G.	F.	5	„ 18	„ 16	„ 17	„ 18	April 20	Confluent	„	64	*Unvaccinated*	. . . . .	Abscesses	65	—	—	—	—
132	J. U.	M.	52	„ 27	„ 16	„ 18	„ 25	March 23	Mild	„	35	Infancy: 3 marks. Re-vaccinated 30 years.	For a week at C, L. H. with rash out	. . . .	—	—	—	—	—

Table of Cases of Small-pox—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
133	J. T.	M.	2	1893. Feb. 25	1893. Feb. 18	1893. Feb. 21	1893. Feb. 23	1893. April 1	Coherent	Rec.	43	*Unvaccinated*		Bronchitis; pertussis	68	—	1	1	1
134	G. H.	M.	29	—	„ 21	„ 23	—	—	Mild	„	—	Infancy: 3 marks	Not recognised. At home		69	—	2	2	1
135	S. H.	F.	26	March 1	„ 25	„ 27	Feb. 27	May 9	Confluent	„	84	*Unvaccinated*		Severe delirium	70	—	3	2	—
136	T. B.	M.	44	„ 2	„ 27	March 1	March 2	March 25	Discrete	„	27	Infancy: 2 marks	Father to 129		67	—	—	—	—
137	M. R.	M.	31	„ 3	March 1	„ 3	„ 3	May 10	Confluent	„	71	„ : 2 „	At Northampton 15th Feb.		71	—	—	—	—
138	E. S.	F.	7	„ 8	„ 1	„ 3	„ 6	April 29	Mild	„	60	*Unvaccinated*		Developed scarlet fever 17th March.	72	1	3	—	2
139	J. W.	M.	29	„ 7	„ 2	„ 6	„ 6	„ 22	Coherent	„	52	Infancy: 3 marks	Infected at Tipshelf, near Sheffield		73	—	3	5	2
140	J. C.	M.	26	„ 7	„ 3	„ 6	„ 6	„ 18	Discrete	„	47	„ : „	Do. do. do.		73	—	—	—	—
141	G. T. H.	M.	39	„ 11	„ 5	„ 7	„ 11	„ 6	„	„	33	„ : 5 „		Conjunctivitis	—	—	—	—	—
142	G. B.	M.	45	„ 13	„ 5	„ 8	„ 11	„ 1	Mild	„	28	„ : 3 „			—	—	—	—	—
143	W. T.	M.	32	„ 10	„ 7	„ 9	„ 10	„ 1	„	„	26	„ : 4 „			68	—	—	—	—
144	J. H. G.	M.	29	„ 11	„ 8	„ 10	„ 10	„ 29	Coherent	„	53	„ : 3 „			—	—	—	—	—
145	J. F.	M.	48	„ 14	„ 8	„ 10	„ 10	„ 1	Discrete	„	25	„ : 6 „		Slight fever	—	—	—	—	—
146	J. C.	M.	64	„ 14	„ 9	„ 11	„ 11	„ 14	„	„	37	„ : 3 „		Delirium tremens	—	—	—	—	—
147	F. H.	M.	4	—	„ 11	?	—	—	„	„	—	*Unvaccinated*			69	—	—	—	—
148	A. H.	F.	29	—	„ 13	?	—	—	Mild	„	—	Infancy: 4 marks			69	—	—	—	—
149	C. P.	F.	16	—	„ 19	?	—	—	„	„	—	Infancy	All at home infected by 134		74	—	—	4	2
150	W. S.	M.	26	March 24	„ 21	March 23	March 23	April 18	„	„	57	Infancy: 4 marks			75	—	1	7	2
151	B. F.	M.	62	„ 29	„ 22	„ 24	„ 24	April 18	Discrete	„	28	Infancy: 2 marks			—	—	—	—	—
152	G. H.	M.	1	—	„ 22	—	—	—	„	„	—	*Unvaccinated*			69	—	—	—	—
153	J. W.	M.	30	—	„ 22	—	—	—	Mild	„	—	Infancy	At home; infected by 134		69	—	—	—	—
154	J. F.	M.	27	March 30	„ 24	March 26	March 30	April 18	„	„	26	Infancy: 5 marks			—	—	—	—	—
155	W. H.	M.	28	„ 30	„ 26	„ 28	„ 29	April 27	Confluent	„	53	*Unvaccinated*			70	—	—	—	—
156	F. P.	M.	23	—	„ 26	—	—	—	Mild	„	—	Infancy	At home; infected by 134		74	—	—	—	—
157	E. B.	M.	35	April 3	„ 27	March 29	April 3	April 29	Discrete	„	32	Infancy: 3 marks			76	—	3	1	1
158	H. B.	F.	21	„ 16	„ 27	„ 29	„ 17	„ 18	Mild	„	21	„ 4 „	Infected by 134		77	—	1	4	3
159	M. W.	F.	33	„ 2	„ 28	„ 30	„ 1	„ 27	„	„	29	„ 2 „			78	—	4	1	2
160	F. W.	F.	30	„ 2	„ 29	„ 31	March 31	May 9	Discrete	„	40	„ 2 „	? infected 15th March at hospital gate	Phlyctenula	70	—	1	1	2

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
161	E. P.	F.	45	1893. April 14	1893. April 2	1893. —	1893. —	1893. —	Mild	Rec.	—	Infancy	At home, 134; mother of 149 and 156		74	—	—	—	—
162	J. H.	M.	39	May 9	„ 2	April 4	May 9	May 13	Coherent	„	40	„ 2 marks	Not medically attended, but in bed 3 weeks.		80	—	1	1	1
163	H. H.	M.	9	April 8	„ 3	„ 5	April 9	„ 25	„	„	51	*Unvaccinated*	? infected at school		81	—	3	2	1
164	T. B.	M.	29	„ 22	„ 3	—	—	—	Mild	„	—	Infancy: 4 marks			82	—	3	2	—
165	E. G.	F.	45	„ 15	„ 4	—	—	—	„	„	—	„			83	1	3	—	3
166	E. M.	F.	21	„ 21	„ 5	April 7	—	—	„	„	—	„ 4 marks	Not notified at first		84	—	2	6	2
167	J. A.	M.	22	„ 14	„ 7	„ 9	April 13	May 2	„	„	26	„ 2 marks	Infected by "T. S." a navvy	About 6 spots	85	—	—	2	3
168	L. B.	F.	8	„ 14	„ 8	„ 10	„ 12	„ 9	Coherent	„	32	*Unvaccinated*	Sister to No. 158		77	—	—	—	—
169	F. H.	M.	35	„ 14	„ 10	„ 12	„ 13	„ 20	Discrete	„	51	Infancy: 3 marks	Infected by "T. S."		85	—	—	—	—
170	M. H.	F.	29	„ 14	„ 10	„ 12	„ 15	„ 6	„	„	27	„ 2 „			85	—	—	—	—
171	A. M.	F.	10	„ 16	„ 10	„ 12	„ 16	„ 13	Mild	„	34	*Unvaccinated*	Grandchildren to 161	Mild attacks	86	1	2	1	2
172	F. M.	F.	8	„ 16	„ 10	„ 12	„ 16	„ 13	Discrete	„	34	„			86	—	—	—	—
173	J. G.	M.	7 months.	„ 15	„ 10	„ 12	14	„ 20	Coherent	„	41	„		Spinal abscess	83	—	—	—	—
174	N. G.	F.	7 years.	„ 15	„ 10	„ 12	„ 14	June 27	Confluent	„	79	„		Hæmorrhagic rash; severe pitting; abscesses.	83	—	—	—	—
175	J. M.	F.	28	—	„ 10	—	—	—	Mild	„	—	Infancy	Thought to have "influenza"		87	1	1	2	1
176	N. B.	M.	33	April 14	„ 11	April 13	April 14	May 10	Discrete	„	30	„ 3 marks	Connected with 156, &c.		88	1	1	1	1
177	E. B.	F.	16	„ 16	„ 12	„ 14	„ 15	„ 9	„	„	28	„ 4 marks			77	—	—	—	—
178	A. M.	F.	29	„ 16	„ 13	„ 15	„ 16	„ 25	Coherent	„	33	*Unvaccinated*	An equivocal scar on left arm. Infected by "T. S."		89	—	3	1	2
179	T. G.	M.	49	„ 17	„ 14	„ 16	„ 17	„ 10	Mild	„	27	Infancy: 3 marks; revaccinated 1887, *nil.*	Connected with 134, &c.		83	—	—	—	—
180	G. B.	M.	33	„ 19	„ 14	„ 16	„ 19	„ 10	Discrete	„	27	Infancy: 3 marks	Infected by "T. S."		90	—	4	1	2
181	W. D.	M.	20	„ 21	„ 16	„ 18	„ 19	July 1	Confluent	Rec.	76	Infancy: 1 mark	? Infected at athletic sports, 2nd April.	Abscesses; iritis	91	—	1	6	2
182	B. M.	F.	9	„ 21	„ 16	„ 18	„ 22	April 24	Malignant	Died	9	*Unvaccinated*	Sister to 166	Hæmorrhages all over body. Pulm. œdema.	84	—	—	—	—
183	L. B.	F.	3½	„ 22	„ 17	„ 19	„ 20	June 8	Discrete	Rec.	53	„	From father, who shows recent stains.	Ecthyma, 30th May	82	—	—	—	—
184	J. S.	M.	16	„ 23	„ 17	„ 19	„ 21	May 30	Confluent	„	44	„		Abscesses; severe pitting.	92	—	—	1	2
185	R. H.	M.	11	„ 23	„ 19	„ 21	„ 22	April 25	Malignant	Died	7	„	Infected by brother, 163	Hæmatemesis; epistaxis.	81	—	—	—	—
186	M. A. L.	F.	25	„ 23	„ 19	„ 21	„ 24	May 13	Mild	Rec.	25	Infancy: 4 marks	Probably by 166	Maturating on admission.	84	—	—	—	—
187	E. M.	M.	6	„ 23	„ 20	„ 22	„ 22	„ 31	Coherent	„	42	*Unvaccinated*	Infected by sister, 166	Abscesses; severe pitting.	84	—	—	—	—
188	H. L.	M.	3½	„ 29	„ 23	„ 26	„ 28	June 8	„	„	47	„		Slight fever and pitting.	93	—	3	—	2

Table of Cases of Small-pox—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
189	E. M.	F.	34	1893. April 28	1893. April 23	1893. April 25	1893. April 27	1893. May 25	Discrete	Rec.	38	Infancy: 3 marks	Mother to 171 and 172	About 6 papules	86	—	—	—	—
190	M. G.	F.	8	„ 29	„ 24	„ 26	„ 28	June 8	„	„	46	April 19, 1893: 3 vesicles.	Sister to 174	Very mild	88	—	—	—	—
191	H. B.	M.	13	May 2	„ 25	„ 27	„ 27	„ 10	Coherent	„	47	*Unvaccinated*	? Infected by calling at 162's house	Abscesses	94	—	3	3	2
192	S. B.	F.	56	—	„ 25	—	—	—	Mild	„	—	Infancy	Probably infected by daughter, 175		95	—	—	6	2
193	L. M.	F.	3	May 2	„ 26	„ 28	March 2	May 25	Confluent	„	30	*Unvaccinated*	Child of 189	Abscesses; phthisis	86	—	—	—	—
194	G. B.	M.	16 months.	„ 1	„ 26	„ 28	April 29	„ 17	„	Died	22	„	Infected by father, 180	Double panopthalmitis; gangrene of legs.	90	—	—	—	—
195	E. B.	F.	18	„ 1	„ 27	„ 29	May 1	June 23	„	Rec.	58	„	Infected in country	Dusky rash; abscesses; severe pitting.	96	—	—	2	2
196	B. S.	F.	2	„ 9	„ 28	May 1	„ 9	„ 8	Coherent	„	42	„	Infected by father at T.	Abscesses	97	—	1	4	2
197	B. B.	F.	5	„ 3	„ 29	„ 1	„ 2	„ 25	Mild	„	56	„		About 6 papules	82	—	—	—	—
198	L. B.	F.	3	„ 3	„ 30	„ 2	„ 2	„ 27	Confluent	Died	58	„	Infected by father, 180	Panophthalmitis; phagedæna of face.	90	—	—	—	—
199	E. H.	M.	16	„ 3	„ 30	„ 2	„ 3	„ 10	Discrete	Rec.	42	„			98	—	2	4	3
200	A. S.	F.	23	„ 5	May 1	„ 3	„ 2	May 15	Mild	„	15	Infancy: 4 marks	Wardmaid at Hospital. Not re-vaccinated.	About 6 papules; hysteria.	—	—	—	—	—
201	A. M.	F.	22	„ 8	„ 2	„ 4	„ 6	„ 31	„	„	30	„ 2 „	At work with 166	About 6 papules	99	—	3	8	2
202	E. H.	F.	36	„ 8	„ 3	„ 5	„ 6	June 20	Coherent	„	49	„ 3 „	? Infected at 162's house		100	—	—	1	2
203	A. G.	M.	26	„ 10	„ 5	„ 7	„ 10	„ 3	Discrete	„	30	„ 3 „	Assisted at burial of 182	? Inoculated	101	1	—	2	2
204	J. B.	M.	60	June 3	„ 6	„ 8	June 3	„ 17	„	„	45	„ 2 „	Husband to 192	Not diagnosed when ill.	95	—	—	—	—
205	T. B.	M.	40	May 13	„ 8	„ 10	May 16	May 30	Mild	„	23	„ 3 „		Maturating on admission.	102	—	1	4	2
206	W. T.	M.	50	„ 15	„ 8	„ 10	„ 15	June 3	„	„	27	„ 3 „			103	—	—	1	2
207	H. W.	M.	23	„ 12	„ 8	„ 10	„ 11	„ 17	Coherent	„	41	„ 3 „	? Infected through "T. S."		104	—	—	7	2
208	W. V.	M.	6	„ 17	„ 10	„ 12	„ 15	„ 20	Confluent	„	42	*Unvaccinated*	? Infected by 196	Abscesses; corneal ulcer.	105	—	2	3	2
209	J. B.	M.	10	„ 14	„ 10	„ 12	„ 12	„ 23	Coherent	„	44	„	Infected by brother, 191	Abscesses; pitting	94	—	—	—	—
210	G. O.	M.	34	„ 16	„ 10	„ 12	„ 15	„ 3	Mild	„	25	Infancy: 3 marks	Assisted No. 203	Maturating on admission. About 6 pustules.	106	—	3	—	2
211	H. W.	M.	17	„ 15	„ 10	„ 12	„ 13	July 5	Confluent	„	57	*Unvaccinated*	? Infected at Sunday school	Abscesses; severe pitting.	107	—	—	2	2
212	C. M.	M.	7	„ 18	„ 11	„ 13	„ 17	June 30	Coherent	„	50	„	Not traced		108	—	4	1	2
213	K. G.	F.	10	„ 17	„ 11	„ 13	„ 16	„ 23	Discrete	„	43	„			109	1	1	2	4
214	A. G.	F.	5	„ 17	„ 11	„ 13	„ 17	„ 17	„	„	37	„		Diagnosis "doubtful." Placed in separate ward.	110	—	2	3	2
215	A. P.	M.	16	„ 16	„ 11	„ 13	„ 15	„ 28	Confluent	„	48	„		Abscesses	111	—	3	4	2

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification,	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
216	J. W.	M.	5	1893. May 17	1893. May 11	1893. May 13	1893. May 16	1893. May 8	Mild	Rec.	28	*Unvaccinated*	Desquamating from scarlet fever on admission.		112	--	3	1	2
217	H. S.	M.	37	„ 16	„ 13	„ 15	„ 16	„ 28	Confluent	„	47	Infancy: 3 marks	"T. S." lodged with him, 24th April to 15th May.	Broncho-pneumonia; delirium tremens.	104	—	—	—	—
218	W. B.	M.	6	„ 16	„ 13	„ 15	„ 15	„ 23	Discrete	„	42	*Unvaccinated*	Brother to 191	Abscesses	94	—	—	—	--
219	W. S.	M.	16	„ 20	„ 17	„ 19	„ 20	„ 28	Mild	„	43	May 16th, 1893: 2 vesicles.		„	104	—	—	—	—
220	W, H.	M.	44	„ 22	„ 17	„ 19	„ 20	„ 3	„	„	18	Infancy: 2 marks	Father to 199		98	—	—	—	—
221	A. H.	F.	21	„ 27	„ 18	„ 20	„ 26	„ 8	„	„	22	„ 1 „	Probably infected by nurse from scarlet fever hospital.	A few papules	113	—	—	6	1
222	E. S.	F.	16	„ 23	„ 19	„ 21	„ 22	„ 30	Confluent	„	43	*Unvaccinated*	From 196, her niece	Abscesses; deep pitting.	97	—	—	—	—
223	J. S.	M.	12	„ 23	„ 19	„ 21	„ 22	July 5	Coherent	„	48	„			97	—	—	—	—
224	W, B.	M.	12	„ 24	„ 20	„ 22	„ 23	June 24	Confluent	„	36	„			114	—	5	3	2
225	F, J,	M.	5	„ 27	„ 20	„ 22	„ 26	July 4	„	„	46	„	Newfoundpool case	Dysenteric attack; abscesses.	115	—	4	2	2
226	M. H.	F.	7	„ 29	„ 21	„ 23	„ 29	June 20	Discrete, m.	„	31	„	Not traced		116	1	2	2	2
227	S. M.	F.	37	„ 29	„ 21	„ 23	„ 29	„ 16	Mild	„	27	Infancy: 4	„	Very mild	117	—	1	4	5
228	A. G.	F.	12	June 1	„ 24	„ 26	„ 31	July 4	Confluent	„	42	*Unvaccinated*	Probably infected at inn at T.	Abscesses	118	—	2	1	3
229	S. D.	F.	24	„ 18	„ 24	—	—	—	Mild	„	—	Infancy: 4 marks	Thought to be varicella		119	—	--	2	—
230	E. W.	F.	30	„ 2	„ 25	May 27	June 1	July 4	Discrete, m.	„	41	„ „		About 6 papules	120	—	3	—	2
231	J, H. H.	M.	11	„ 2	„ 26	„ 28	„ 1	June 8	Mild	„	44	„ „			121	—	4	1	2
232	L. P.	F.	8	„ 2	„ 27	„ 29	„ 31	July 4	Confluent	„	39	*Unvaccinated*	Not traced		122	—	1	2	3
233	H. H.	M.	8	„ 2	„ 27	„ 29	„ 2	„ 4	Coherent	„	39	„	Probably infected by 213		123	—	4	—	4
234	S. P.	M.	42	„ 2	„ 27	„ 29	May 31	„ 28	Confluent	„	62	„	Probably infected at S. Wigston	High fever; delirium; abscesses.	124	—	1	5	2
235	J. W, S.	M.	39	„ 3	„ 27	„ 29	June 2	„ 5	Discrete	„	40	Infancy: 3 marks	„ „		125	—	—	2	3
236	J. N,	M.	28	„ 1	„ 28	„ 30	May 31	June 8	Malignant	Died	12	*Unvaccinated*	? At Sewer Works	Hæmorrhages	126	1	2	5/	1
237	J. M.	M.	25	„ 2	„ 28	„ 30	Juno 1	July 14	Coherent	Rec.	49	At 10 years: 5 marks		Abscesses; marked pits.	87	—	—	—	—
238	E. G,	M.	4 months.	„ 3	„ 29	„ 31	„ 2	June 23	„	„	26	*Unvaccinated*	From sister 213	Pertussis. Slight pitting.	109	—	—	—	—
239	E. C.	F.	10	„ 2	„ 29	„ 31	„ 1	July 4	„	„	37	„	Probably by 212		127	1	2	3	2
240	J. W.	M.	30	„ 3	„ 30	June 1	„ 2	June 17	Discrete, m.	„	19	Infancy: 2 marks	By son, 216	About 12 papules	112	—	—	—	—
241	G. W. R.	M,	23	—	„ 30	May 31	—	June 8	„ m.	„	—	„ 4 „	Thought to be varicella		128	—	3	4	2
242	N. H,	F.	19	June 5	„ 31	June 2	June 3	June 27	„ m.	„	28	„ 5 „	Not traced	About 12 papules	129	—	—	3	2
243	A, G.	F.	52	„ 5	June 1	„ 3	„ 6	„ 30	Coherent	„	30	„ 3 „	Infected by 204		130	—	—	2	2

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
244	R. H.	M.	48	1893. June 6	1893. June 1	1893. June 3	1893. June 6	1893. July 14	Confluent	Rec.	44	Infancy: 3 marks	By daughter, 221	Delirium tremens; albuminuria.	113	—	—	—	—
245	E. H.	F.	18	„ 6	„ 2	—	—	—	Mild	„	—	„ 3 „			113	—	—	—	—
246	E. H.	F.	16	„ 6	„ 4	June 6	June 6	June 20	„	„	17	„ 3 „	Same family as 221		113	—	—	—	—
247	G. H.	M.	13	„ 10	„ 4	„ 6	„ 9	„ 24	„	„	21	„ 4 „		About 6 papules	113	—	—	—	—
248	P. H.	M.	15	„ 15	„ 4	—	—	—	„	„	—	„ 2 „			113	—	—	—	—
249	A. A.	F.	27	„ 12	„ 7	June 9	June 11	June 30	Discrete	„	24	„ 5 „	Infected by 227		131	—	3	2	1
250	G. P.	F.	24	„ 11	„ 7	„ 9	„ 11	„ 27	Mild	„	21	„ 1 „	Visited H. family (204, &c.) on 25th May.	About 6 papules	132	—	2	2	2
251	W. A.	M.	28	„ 14	„ 8	„ 10	„ 12	July 22	Coherent	„	45	*Unvaccinated*	Work with 220		133	—	2	2	—
252	N. W.	M.	5	„ 12	„ 8	„ 10	„ 12	„ 18	Discrete	„	41	„	Infected by mother, 230	Abscesses; slight pitting.	120	—	—	—	—
253	W. W.	M.	34	„ 12	„ 9	„ 11	„ 12	„ 1	„ m.	„	23	Infancy: 3 marks	By wife, 230	About 6 papules	120	—	—	—	—
254	T. R. R.	M.	20	„ 15	„ 10	„ 12	„ 14	Aug. 9	Confluent	„	61	*Unvaccinated*		Dusky rash; abscesses	134	—	1	6	2
255	G. D.	M.	24	„ 18	„ 10	„ 12	„ 17	July 1	Mild	„	22	Infancy: 4 marks	Husband to 229	About 6 papules	119	—	—	—	—
256	E. B.	F.	17	„ 14	„ 11	„ 13	„ 13	„ 15	Confluent	„	35	„ 3 „			135	—	4	4	3
257	K. R.	F.	14	„ 17	„ 11	„ 13	„ 15	„ 4	Discrete	„	24	„ 1 „	Sister to 241		128	—	—	—	—
258	A. E. M.	F.	8 months.	„ 14	„ 11	„ 13	„ 13	Aug. 8	Confluent	„	59	*Unvaccinated*	Infected by father, 237		87	—	—	—	—
259	E. W.	F.	34	„ 18	„ 12	„ 14	„ 16	July 7	Discrete	„	36	Infancy	Newfoundpool case		136	—	1	1	2
260	C. B.	M.	10	„ 15	„ 12	„ 14	„ 15	„ 22	Coherent	„	41	*Unvaccinated*	Notified as scarlet fever	Abscesses	137	—	2	3	1
261	E. W.	F.	3½	„ 15	„ 12	„ 14	„ 15	„ 18	Confluent	„	37	„		Laryngitis; otitis; abscesses.	120	—	—	—	—
262	A. R.	F.	2	„ 17	„ 13	„ 15	„ 16	Aug. 8	„	„	57	„	Sisters to 241	Abscesses	128	—	—	—	—
263	E. R.	F.	21	„ 21	„ 13	„ 15	„ 19	July 4	Mild	„	22	Infancy: 4 marks		Very mild	128	—	—	—	—
264	G. C.	M.	3	„ 17	„ 13	„ 15	„ 17	„ 20	Discrete	„	38	*Unvaccinated*	Brother to 228		127	—	—	—	—
265	W. B.	M.	13	„ 17	„ 13	„ 15	„ 16	Aug. 1	Confluent	„	50	„	? Infected by visit to 253	Abscesses	135	—	—	—	—
266	E. B.	F.	7	„ 17	„ 13	„ 15	„ 17	July 25	„	„	43	„		„	138	—	1	2	1
267	H. R.	M.	8	„ 20	„ 14	„ 16	„ 19	„ 4	Mild	„	21	Infancy: 4 marks	Same family as 241	Very slight cases and put in isolation ward.	128	—	—	—	—
268	E. R.	M.	12	„ 20	„ 14	„ 16	„ 19	„ 4	„	„	21	„ 3 „			128	—	—	—	—
269	E. O.	F.	14	„ 21	„ 15	„ 17	„ 20	„ 20	Discrete	„	36	„ 2 „		Slight pitting	139	—	—	4	2
270	G. R.	M.	51	„ 20	„ 15	„ 17	„ 19	„ 8	„ m.	„	24	„ 2 „	Father to 241		128	—	—	—	—

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates.				
															Ref. No.	Under 1 Year.	1 to 10.	10 to 39.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
271	L. L.	M.	5	1893. June 19	1893. June 15	1893. June 17	1893. June 19	1893. Aug. 1	Confluent	Rec.	48	*Unvaccinated*		Abscesses	140	—	3	4	2
272	A. P.	F.	39	„ 20	„ 16	„ 18	„ 19	July 13	Discrete	„	28	Infancy: 3 marks	Infected by 232		122	—	—	—	—
273	M. R.	F.	7	„ 20	„ 17	„ 19	„ 19	„ 18	„	„	32	*Unvaccinated*	Same family as 241, &c.	Abscesses	128	—	—	—	—
274	D. L.	M.	5	„ 20	„ 17	„ 19	„ 20	Aug. 15	Confluent	„	60	„	Newfoundpool case	Abscesses: pneumonia; severe pitting.	141	—	3	1	2
275	H. U.	M.	25	„ 21	„ 18	„ 20	„ 20	July 19	Coherent	„	32	Infancy: 1 mark	„ „	Gastric catarrh	142	—	—	3	—
276	A. M.	F.	36	„ 23	„ 18	„ 20	„ 21	„ 11	Discrete, m.	„	24	„ 3 „	„ „		143	—	3	1	1
277	H. L.	M.	20	„ 28	„ 19	„ 21	„ 25	„ 14	„ m.	„	26	„ 3 „		About 12 papules	144	—	1	5	2
278	G. T.	M.	18	„ 26	„ 19	„ 21	„ 23	„ 8	Mild	„	20	„ 5 „	Newfoundpool case		145	—	—	8	1
279	S. B.	F.	42	„ 24	„ 19	„ 21	„ 23	„ 7	„	„	19	*Unvaccinated*	„ „	Had small-pox 40 years ago (pitted). Present attack about 6 papules.	146	—	—	1	2
280	T. O.	M.	26	„ 26	„ 21	„ 23	„ 25	„ 1	„	„	11	Infancy: 4 marks	„ „	About 6 papules	147	—	—	3	2
281	G. B.	F.	6	„ 27	„ 22	„ 24	„ 25	„ 18	Discrete, m.	„	27	*Unvaccinated*	„ „	About 24 papules	148	—	3	1	1
282	E. L.	F.	8	„ 24	„ 22	„ 24	„ 24	Aug. 1	Confluent	„	41	„	Sister to 274	Very severe; abscesses	141	—	—	—	—
283	E. A. G.	F.	6	„ 27	„ 23	„ 25	„ 27	July 13	Mild	„	21	„	Newfoundpool case	Very mild	149	1	3	—	2
284	G. P.	M.	22	„ 28	„ 23	„ 25	„ 27	„ 19	Discrete, m.	„	27	Infancy: 4 marks	„ „	About 24 papules	150	—	1	1	2
285	J. B.	M.	43	July 1	„ 23	„ 26	„ 30	„ 14	Mild	„	22	„ 3 „	„ „ next door to 251		151	—	2	1	2
286	M. B.	F.	18	„ 1	„ 26	„ 28	July 1	„ 13	„	„	18	„ 3 „	Visited house in N. F. P., 13th June	About 12 papules	152	—	—	4	1
287	S. M.	F.	47	Aug. 1	„ 28	„ 30	„ 31	Aug. 22	Coherent	„	56	„ 2 „		Anomalous case (? not small-pox).	153	—	2	5	2
288	S. A. L.	F.	32	July 3	„ 29	July 1	„ 2	July 12	Confluent	Died	14	*Unvaccinated*	Infected by child 274	Dusky rash	141	—	—	—	—
289	E. L.	F.	3	„ 3	„ 29	„ 1	„ 2	„ 15	Mild	Rec.	17	„	Sister to 271. Desquamating from scarlet fever.	Scanty rash; doubtful	140	—	—	—	—
290	E. C.	F.	18 months.	Aug. 8	„ 30	„ 2	„ 8	Aug. 3	Coherent	„	35	„	Newfoundpool case	At home 6 weeks	154	1	2	—	2
291	E. S. L.	M.	40	July 5	July 2	„ 4	„ 4	July 22	Discrete	„	21	Infancy: 3 marks. Revaccinated 1871.	Father of 271 and 289	About 36 papules	140	—	—	—	—
292	G. T.	M.	22	„ 11	„ 2	„ 4	„ 9	„ 22	Mild	„	21	Infancy: 2 marks		About 24 papules	155	—	—	1	2
293	A. W.	M.	10	„ 10	„ 4	„ 6	„ 9	Aug. 15	Coherent	„	43	*Unvaccinated*	Newfoundpool case	Large papule; severe pitting.	156	—	4	5	2
294	E. A.	M.	23	„ 11	„ 5	„ 7	„ 11	„ 16	„	„	43	„		Bronchitis; abscesses; marked pitting.	157	—	3	3	2
295	C. P.	F.	29	„ 11	„ 6	„ 8	„ 10	„ 1	Mild	„	27	Infancy: 3 marks	Was near hospital 24th June		158	—	—	1	1

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
296	W. S.	M.	11	1893. July 9	1893. July 6	1893. —	1893. —	1893. —	Mild	Rec.	—	*Unvaccinated*	Doubtful case. Varicella?		159	—	1	3	1
297	A. K.	F.	45	„ 11	„ 8	July 10	July 11	Aug. 22	Confluent	„	46	Infancy: 2 marks	Nursing patient who died from "typhoid" 24th June.		160	—	1	—	3
298	W. B.	M.	17	„ 13	„ 9	„ 11	„ 12	„ 2	Coherent, m.	„	25	„ 4 „	Newfoundpool case		161	—	—	4	2
299	W. A. C.	M.	3	Aug. 8	„ 14	„ 16	Aug. 8	„ 22	Confluent	„	39	*Unvaccinated*	Brother to 290	At home 4 weeks	154	—	—	—	—
300	E. F.	F.	20	„ 4	„ 22	„ 24	July 26	„ 8	Mild	„	18	Infancy: 4 marks	Newfoundpool case	About 6 papules	162	—	1	6	1
301	E. A. D.	F.	21	July 27	„ 22	„ 24	„ 27	„ 15	Discrete	„	25	„ 4 „	„ „		163	—	—	3	—
302	S. S.	M.	29	Aug. 4	„ 25	„ 27	Aug. 2	„ 16	Mild	„	33	„ 5 „	„ „	About 24 papules	164	1	1	3	—
303	C. G.	F.	25	„ 4	„ 25	„ 27	„ 4	„ 17	Discrete	„	24	„ 2 „	„ „	Lactation	165	—	2	2	2
304	C. P.	F.	20	July 29	„ 25	„ 27	July 29	„ 12	Mild	„	19	„ 4 „	„ „		166	—	—	3	1
305	M. A. E.	F.	31	„ 31	„ 26	„ 28	„ 31	„ 22	Coherent	„	28	„ 3 „			167	—	—	1	3
306	J. S.	M.	49	„ 30	„ 27	„ 29	„ 30	„ 19	„	„	24	„ 3 „	Newfoundpool case		168	—	—	4	2
307	K. S.	F.	30	Aug. 9	„ 28	„ 30	—	—	Mild	„	—				169	—	—	5	3
308	L. C.	F.	22	„ 13	„ 31	Aug. 2	Aug. 9	„ 22	Discrete	„	23	Infancy: 5 marks			170	1	—	2	—
309	E. J. C.	F.	2½	„ 5	Aug. 1	„ 3	„ 4	Oct. 7	Confluent	„	68	*Unvaccinated*		Abscesses; deep pitting	171	1	5	1	1
310	C. M. E.	F.	37	„ 14	„ 9	„ 11	„ 13	Aug. 24	Mild	„	16	Infancy, 4 marks. Revaccinated July 31.	One mark, sister to 305		167	—	—	—	—
311	E. H.	F.	8 months.	„ 16	„ 10	„ 12	„ 15	„ 22	Confluent	Died	13	*Unvaccinated*	? Infected by mother and wife (not reported).		172	1	1	1	—
312	G. O. H.	M.	26	„ 16	„ 10	„ 12	„ 15	„ 31	Mild	Rec.	22	Infancy: 2 marks	Ditto		172	—	—	—	—
313	E. S.	F.	6	„ 16	„ 12	„ 14	„ 15	Oct. 12	Confluent	„	62	*Unvaccinated*	Daughter to 302	Dusky rash; abscesses	164	—	—	—	—
314	A. H.	F.	24	„ 15	—	—	—	—	Mild	„	—	Infancy: ? 3 marks			173	—	—	2	1
315	E. T.	F.	9	„ 16	„ 13	„ 15	„ 17	Sept. 19	Discrete	„	38	*Unvaccinated*	Newfoundpool case	Probably infected by 290	174	—	3	5	1
316	C. T.	F.	4	„ 19	„ 16	„ 18	„ 19	„ 11	Confluent	Died	27	„	„ „	Hæmorrhages	174	—	—	—	—
317	E. H.	F.	8	„ 24	„ 21	„ 23	„ 24	„ 30	Discrete	Rec.	41	„		Slight pitting	175	—	2	1	2
318	M. J. C.	F.	22	Sept. 2	„ 26	„ 28	Sept. 2	„ 19	Mild	„	25	Infancy: 3 marks		Lactation	176	—	1	4	2
319	E. F.	F.	20	„ 7	„ 30	Sept. 1	„ 5	„ 19	„	„	21	„ 4 „	Newfoundpool case	About 12 papules	177	—	1	2	2
320	C. C.	F.	1 month.	„ 6	„ 31	„ 2	„ 3	„ 29	Confluent	„	30	*Unvaccinated*	„ „	Severe, but slight pitting.	178	1	2	1	1
321	O. K.	F.	9	„ 6	Sept. 3	„ 5	„ 6	Oct. 28	„	„	56			Conjunctivitis; otitis; abscesses.	179	1	2	3	2
322	F. W.	F.	12	„ 11	„ 6	„ 8	„ 11	„ 12	Discrete, m.	„	37	„		Mastoid abscess	180	—	3	3	2

TABLE OF CASES OF SMALL-POX—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates.				
															Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
323	F. D.	F.	17	1893. Sept. 14	1893. Sept. 21	1893. Sept. 13	1893. Sept. 14	1893. Sept. 30	Mild	Rec.	20	Infancy : 4 marks			181	1	3	5	2
324	S. F.	F.	14	„ 14	„ 11	„ 13	„ 14	Oct. 21	Confluent	„	41	*Unvaccinated*	Infected by 318		176	—	—	—	—
325	C. F.	F.	7	„ 14	„ 11	„ 13	„ 13	„ 28	„	„	48	„	„ „	Abscesses	176	—	—	—	—
326	E. R.	F.	19	„ 14	„ 11	„ 13	„ 13	Sept. 26	Mild	„	16	Infancy : 3 marks	„ „		176	—	—	—	—
327	E. F.	F.	10	„ 14	„ 12	„ 14	„ 14	„ 26	„	„	15	„ 4 „	„ „	6 papules	176	—	—	—	—
328	G. F.	F.	9	„ 20	„ 18	„ 20	„ 21	Dec. 1	Confluent	„	74	*Unvaccinated*	Infected by 319	Otitis ; abscesses	177	—	—	—	—
329	M. W.	F.	10	„ 29	„ 20	„ 22	„ 23	Nov. 18	„	„	60	„	Sister to 329	Abscesses	180	—	—	—	—
330	A. B.	M.	28	„ 26	„ 20	„ 22	„ 24	Oct. 10	Mild	„	21	Infancy : 2 marks			182	—	1	2	1
331	F. L. C.	F.	18 months.	„ 27	„ 11	„ 23	„ 26	Nov. 2	„	„	43	*Unvaccinated*	Child of 313		183	—	1	2	1
332	M. A. W.	F.	45	„ 29	„ 21	„ 23	„ 24	Oct. 12	„	„	22	Infancy : 2 marks	Mother of 322		180	—	—	—	—
333	A. B.	M.	42	Oct. 13	Oct. 5	Oct. 7	Oct. 9	Nov. 4	„	„	31	„ 4 „		Conjunctivitis	184	—	3	4	2
334	J. A.	M.	17	Nov. 3	„ 6	„ 8	—	—	„	„	—	„ 3 „	Not admitted		185	—	2	5	2
335	A. S.	F.	22	„ 3	„ 9	„ 11	—	—	„	„	—	„ 3 „	„		186	—	1	5	—
336	E. B.	F.	28	„ 7	„ 10	„ 12	—	—	Discrete	„	—	„ 3 „	„		187	1	2	2	1
337	E. M.	F.	25	Oct. 19	„ 14	„ 16	Oct. 18	Nov. 2	Mild	„	20	„ 3 „		About 12 papules	188	—	—	10	Age ? 9
338	H. S.	M.	18 months.	Nov. 3	„ 20	„ 30	Nov. 3	Dec. 14	Confluent	„	56	*Unvaccinated*		Conjunctivitis; abscesses.	186	—	—	—	—
339	K. B.	F.	29	Oct. 31	„ 27	„ 29	Oct. 30	Nov. 10	„	Died	15	„		Hæmorrhages	189	—	2	2	—
340	E. A.	F.	10	Nov. 3	„ 28	„ 30	Nov. 1	Dec. 9	Discrete	Rec.	43	„		Abscesses	185	—	—	—	—
341	A. B.	M.	2	„ 7	Nov. 2	Nov. 4	„ 6	„ 22	Confluent	„	51	„	? From mother, 336	Conjunctivitis : abscesses,	187	—	—	—	—
342	E. A.	F.	8	„ 16	„ 13	„ 15	„ 16	„ 19	Coherent	„	37	„		Abscesses	185	—	—	—	—
343	S. T.	M.	18	„ 22	„ 16	„ 18	„ 21	„ 8	Mild	„	23	Infancy : 4 marks			190	—	—	4	2
344	J. B.	M.	35	„ 23	„ 20	„ 22	„ 23	Jan. 23	Confluent	„	65	„ 2 „			187	—	—	—	—
345	A. G.	M.	33	„ 23	„ 20	„ 22	„ 23	„ 13	„	„	55	„ 2 „			149	—	—	—	—
346	A. M.	F.	20	„ 27	„ 21	„ 23	„ 24	Dec. 16	Mild	„	26	„ 4 „	Influenza ? 8th Dec.		191	—	1	4	2
347	L. M.	F.	6	„ 27	„ 21	„ 23	„ 24	Jan. 5	Confluent	„	36	*Unvaccinated*	Newfoundpool case	Abcesses	192	—	2	2	1
348	A. R. R.	F.	7	„ 28	„ 22	„ 24	—	—	Malignant	Died	—	„	„ „	Convulsions ; hæmorrhages.	193	1	3	3	2
349	A. S.	M.	19	Dec. 5	„ 27	„ 29	Nov. 30	Dec. 22	Discrete	Rec.	27	Infancy : 3 marks		Carbuncle, 9th Dec.	194	—	—	5	2
350	E. Y.	F.	42	„ 4	„ 30	Dec. 2	Dec. 3	Jan. 13	Coherent	„	50	„ 4 „	Newfoundpool case		195	—	1	1	3

Table of Cases of Small-pox—*cont.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Admission to Hospital.	Termination.	Type of Attack.	Result.	Duration in Days.	Vaccination Data.	Remarks.	Clinical Features of Attack.	Households. All Inmates. Ref. No.	Under 1 Year.	1 to 10.	10 to 30.	30 Years upwards.
Col. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
				1893.	1893.	1893.	1893.	1893.											
351	M. M. R.	F.	19	Dec. 6	Dec. 3	Dec. 5	Dec. 5	Dec. 19	Mild	Rec.	17	Infancy: 4 marks	Infected by 348	Six papules	193	—	—	—	—
352	F. R.	F.	2	„ 6	„ 3	„ 5	„ 5	„ 7	Malignant	Died	5	*Unvaccinated*	„ „	Hæmorrhagic	193	—	—	—	—
353	A. M.	F.	27	„ 10	„ 6	„ 8	„ 8	Feb. 1	Confluent	Rec.	58	„	Infected by 347	Dusky rash; abscesses	192	—	—	—	—
354	M. Y.	F.	6	„ 14	„ 12	„ 14	„ 14	„ 1	„	„	52	„		Abscesses	195	—	—	—	—
355	W. G. C.	M.	6	„ 17	„ 12	„ 14	„ 16	Jan. 23	„	„	43	„	Infected by 350	„	196	1	3	2	2
356	A. R.	M.	11	„ 27	„ 18	„ 20	„ 26	„ 23	Discrete	„	37	„		„	197	—	4	5	2
357	H. M. F.	F.	20 months.	„ 25	„ 20	„ 22	„ 24	Feb. 1	Coherent	„	54	„		Ototis	198	—	1	—	3
														193 households		33	328	533	331 Age? 9

Note.—This list does not include the case of W.S, m., æt. 18, admitted into the small-pox hospital on April 18th, 1893, from the county (Thurmaston). He was unvaccinated, and had a severe (confluent) attack.

Eleven of these cases were unrecognised at the time of their illness, and were not notified to the authorities, viz., Nos. 38, 134, 147, 148, 149, 152, 153, 156, 175, 192, 241.

From this table it will be seen that of all the cases, 7 are assigned as malignant, 89 as confluent, 56 as coherent, 78 as discrete, and 127 as mild in type.

In his Report, Dr. Priestley points out that several others here termed "confluent" were malignant or quasi-malignant in character, viz., Nos. 3, 9, 15, 21, 26, 28, 30, 54, 61, 105, 110, 114, 135, 174, 194, 195, 198, 234, 254, 288, 309, 313, 316, 321, 325, 339, 353.

§ 9. *Summary of the outbreak.*

It is not my intention to enter into a detailed history of the outbreak, as that has been amply done by Dr. Priestley in the various reports he has presented to the Sanitary Committee, whilst the earlier stages of the epidemic were exhaustively inquired into and reported upon by a Special Committee. It may, be useful if I present a summary of the whole outbreak month by month, completed by the after knowledge of all the available facts.

I propose, therefore, to mention in turn the fresh invasions of each household in each month, with brief reference to the ascertained sources of their infection and of the cases secondarily arising. In tabular form, the numbers of invaded houses per month are as follows :—

Month.	Number of Houses Invaded.	Numbers Attacked.	Cases arising in		
			Fever Hospital.	Work-house.	Lee Street Common Lodging-House.
1892.					
August	—	—	—	1	—
September	3	5	—	1	—
October	3	3	7	—	1
November	9	12	—	1	1
December	11	35	1	1	—
1893.					
January	35	46 (47*)	2	2	
February	7	15	—	2	1
March	9	14	—	2	5
April	19	44	—	—	—
May	31	53	1	—	—
June	25	32	—	—	—
July	16	18	—	—	—
August	8	15	—	—	—
September	5	7	—	—	—
October	6	11	—	—	—
November	6	10	—	—	—
December	3	3	—	—	—
	196	323	11†	10	12

* One case re-admitted: apparently re-infected.
† This only includes those cases which arose in hospital and were not removed, but merely transferred to small-pox wards.

1892.

August.—On the 24th of this month, a tramp, W. S., who had been lodging in the town since the 21st, applied for admission to the workhouse infirmary. He had a scanty eruption, the nature of which was not recognised, and he was discharged on August 30. The subsequent occurrence of cases of small-pox in persons known to have been in his company led to the discovery of this,—the first case known in this outbreak. He returned to Leicester some weeks afterwards, and, through Dr. Priestley's courtesy, I was able to see the man. He presented stains and traces of the eruption over the shoulders and on the forearms; and a smooth small cicatrix on the arm where he said that he had been vaccinated in infancy.

No. 1.

Nos. 2 and 3. *September.*—On the 4th, Mrs. M. (No. 2), and on the 5th, Mrs. B. (No. 3), who had been living in the lodging-house when W. S. stayed there, sickened; and on the 7th and 8th respectively the rash appeared. No. 2 was admitted into the hospital on September 9, and No. 3 on the 10th. The latter who was unvaccinated had a more severe attack than No. 2, who presented two vaccination scars. The husband and infant of No. 3 were taken into quarantine, and on leaving there on September 19th, the infant was taken charge of by some friends. This infant (No. 5), was vaccinated when taken to quarantine, but about the 27th, developed a few equivocal spots. It is not unlikely that the child really had a very mild attack of variola, for two persons who nursed her after she had left quarantine, developed the disease, viz.:—P. J. (No. 8) and E. R. (No. 9). In the one case the rash appeared on October 15, in the other on the 17th; both were confluent attacks, that of No. 9 (who was unvaccinated) being accompanied by hæmorrhages. An aunt of No. 9, M. S. (No. 18), who did not come into quarantine, sickened on November 3, *i.e.*, 13 days after E. R.'s removal to hospital. No. 4 was an inmate of the ward in the workhouse infirmary into which W. S. was sent on August 24 to 30th; he was suffering from syphilitic caries of the skull and was in a debilitated state. The rash of small-pox developed in him on September 9, and he died in the hospital in a confluent attack, on the 16th. It was not possible to obtain clear evidence of his having been vaccinated, but the fact that in early life he had been in the navy was held to be presumptive in favour of this.* Towards the end of the month, E. J. K. (No. 6), in the employ of the Corporation was attacked. The origin of his illness is obscure but apparently the view that most commended itself to those in authority was that he may have been infected through contact with dry refuse which he was engaged in carting from the ashpit of an infected house. But whatever the source of his illness, it was the indirect cause of many cases of the disease that occurred in the following month. He was removed to the hospital on October 3rd, the day in which his rash appeared, and had a confluent attack, very severe at the outset, but rapidly drying up on maturation. He had four vaccination marks of infantile vaccination. At the same time that he was admitted, five other persons were taken to quarantine. One of these was his daughter, E. K. (No. 7), who was forthwith vaccinated.

No. 5.

Nos. 8 and 9.

No. 18.

No. 4.

No. 6.

No. 7.

Outbreak in the Fever Wards.—The child E. K. had not been in quarantine nine days before she contracted scarlet fever. At this time the three fever wards were full of children in all stages, and the convalescent block (or old erysipelas ward) contained large numbers of convalescent. Indeed the accommodation of the building was strained to its utmost. E. K. was removed from the quarantine ward (9 in plan) to Ward I. This was on October 11th, and it so happened that a few days before this one or two of the fever patients had developed varicella. The only means of isolation left in the building were the small rooms at the entrances to wards I., II., and III., and it was into one of those that the cases of varicella were transferred. On October 15, *i.e.*, 12 days after her father developed the rash of small-pox and was removed to hospital, the child E. K., who, it may be recalled, was "undergoing vaccination," presented an eruption the characters of which were at first uncertain. The eruption was sparse, and the individual papules small, and although there was not an unanimous opinion as to its nature, yet in face of the fact that some of her ward mates had undoubted varicella, and from the lack of any other isolation accommodation, she was sent on October 15 to the small ward where three other varicella cases were, and indeed occupied a bed with one of them. Her case, however, did not run the course of varicella. On October 17 the three other children were removed from the small ward, and on October 19 E.K. was removed to the small-pox ward, there being no longer any doubt that she had contracted this disease from her father, and that its characters in her had been modified by her recent vaccination. She was then desquamating from scarlet fever. E. K., during the earlier period of her attack of small-pox, had thus been in Ward I. (full of scarlet fever cases) from October 14 (?) to October 15; and in Ward I. (annex) with three fever cases who had varicella from October 15 to October 17.

Of the 43 children suffering from scarlet fever in Ward I. when E. K. was an inmate, five developed small-pox. One of these, E. L. (No. 12), was probably infected before admission on October 18th, as she sickened with small-pox on the 26th. Another, H. C. (No. 21), may have been infected directly by No. 12, for she is said to have shared her bed on October 28th, *i.e.*, the day before the rash appeared in E. L. At any rate, H. C. fell ill on November 10th, *i.e.*, the 14th day of this possible exposure to infection. The infection of the three other children must, I believe, be attributed to contact with E. K., during the time that she was isolated with them for supposed varicella. That period of exposure, October 15 to 17, harmonises with the dates of their developing small-pox, viz.: G. B. (No. 11) on October 27, G. F. (No. 14) on October 29, and S. W. (No. 16) on October 29.

No. 12.

No. 21.

Nos. 11, 14, 16.

* As the case of W. H. (No. 4) excited much attention, especially, in regard to the question of his having been vaccinated and possibly re-vaccinated, it may be of interest to supplement the above brief statement with a record of the facts as elicited by the Special Committee which inquired into the origin of the small-pox outbreak. It appears that he was discharged from the navy on July 14, 1879, after having served for 14 years and 241 days. The order making re-vaccination compulsory in the navy was passed in 1871. His papers were produced before the Committee, but owing to their mutilated condition the record of his state as to vaccination had been effaced. We are then without any evidence of this, and hence this case has been classified as "vaccination doubtful or uncertain." *Vide* Minutes of Special Committee, pp. 382, 383.

—	Admitted for Scarlet Fever.	Ward.	Attacked with Varicella.	Sent Home from Hospital.	Small-pox.	
					Onset.	Rash.
No. 11, G. B.	Oct. 7	I.	Oct. 11	—	Oct. 27	Oct.
„ 12, E. L.	„ 18	I.	—	—	„ 26	„ 29
„ 14, J. F.	Sept. 15	I.	Oct. 10	—	„ 29	„ 31
„ 15, F. B.	Oct. 19	III.	—	—	„ 29	Nov. 1
„ 16, S.W.	Sept. 15	I.	Oct. 6	—	„ 30	—
„ 20, N.H.	About Sept. 20	?	„ 16*	Oct. 21	Nov. 3	Nov. 5
„ 21, H. C.†	Oct. 4	I.	—	—	„ 10	„ 12
„ 23, R. L.	„ 15	III.	—	Nov. 9	„ 13	„ 16
„ 25, E. P.	„ 28	III.	—	—	„ 16	„ 20
„ 26, F. H.	„ 12	III.	—	Nov. 9	„ 18	„ 21
„ 28, L. D.	„ 27	II.	—	„ 21	„ 23	„ 25
„ 29, M. R.	„ 28	II.	—	„ 15	„ 29	Dec. 1
„ 30, A. J.	„ 19	III.	—	„ 29	Dec. 2	„ 4

* Placed in the Quarantine Ward which had been disinfected when the K. family left on October 15th.
† Said to have occupied same bed as E. L. (No. 12), on October 28th.

It is, however, impossible to ascribe the infection of all those who were attacked with small-pox whilst in the hospital to this origin. For eight other children, five in Ward III., two in Ward II., and one, placed in the quarantine ward, because of varicella in other parts of the building, contracted the disease. One of them, F. B. (No. 15). may, like No. 12, have been incubating small-pox when attacked with scarlet fever. The rest must have been infected in the hospital; how, it is only a matter of conjecture, but hardly of surprise, seeing that Ward III. is only distant a few yards from the small-pox wing which was then receiving patients. It may be, too, that N. H. (No. 20), who before leaving developed varicella, and was isolated in the quarantine ward just vacated by the family of E. K. (but thoroughly fumigated), was infected there. She and five others were sent home, and had to be re-admitted with small-pox, which had appeared in them 13, 4, 9, 2, 14, and 3 days respectively, after leaving the hospital.

Lastly, in three instances the children infected other members of the family. R. L. (No. 23), who was sent home on November 9, and sickened with small-pox on the 13th, apparently infected his mother (No. 32), who developed small-pox in quarantine on December 1st,* F. H. (No. 26), who was sent home on November 9, and sickened with small-pox on the 18th, infected his brother (No. 31) with whom he slept, and who was attacked on December 4th, 12 days after No. 26 returned to the hospital. M. R. (No. 29), who was sent home, on November 15th, sickened with small-pox on the 29th, so that she probably was infected on leaving the hospital. She was re-admitted on December 1st, and her father, W. R. (No. 36), fell ill on the 12th, and had a very sparse papular eruption on the 14th; he was admitted on December 17th.

Thus, taking the whole series of cases which arose in the hospital wards or were connected with them, we find them ranging from September 15 to December 14, a period of two months.

The hospital was cleared of its scarlet fever inmates by October 31st, with the exception of a few who were too ill to leave.

It may be added that of these 158 scarlatinal cases 74 were found to be vaccinated; and 10 were vaccinated on the appearance of small-pox in the wards and within 24 hours of their return home. All the children attacked with small-pox were unvaccinated, and three of their number (13) died.

October.—On the 24th of this month a man (No. 10) was found in the streets with a maturating eruption. He was employed as a porter and lived at a common lodging-house. He had had some pain in the back on the 18th, but had not felt ill, and he first noticed a rash on the 21st. He was 57 years of age and had been vaccinated in infancy. The establishment accommodates 104 lodgers, and seems to be well managed. I had an opportunity of visiting it, and was informed that there were 85 to 90 "lodgers," several of whom were often absent at work for a week at a time. There is a large day room and kitchen on the ground floor, with lavatory and w.c. at the back; the upper floors being divided into cubicles for the inmates. This man had lived there for two years. When he first fell ill he was moved with his bed and bedding from his cubicle to a separate room. So far as could be ascertained (for in the interval some 12 or 14 had left) only one other inmate contracted small-pox. This was W. R. (No. 19), who had occupied a cubicle in the same dormitory as No. 10 He was attacked on November 3, the rash appearing on the 5th. On the discovery of the first case the house was visited daily by the sanitary inspector. Re-vaccination was offered to the inmates, but none accepted it. Another case arising in October was that of T. G. (No. 13), who had been employed at the hospital, part of his duty consisting in carrying coals into the wards. He had thus occasion to visit the small-pox wards daily; but had declined to be re-vaccinated. He was taken ill on the 27th; rash on 29th.

November.—On the 3rd of this month M. A. J., æt. 45 (No. 17), who was employed in laundry work at the hospital, was attacked with confluent small-pox. She had possibly been infected through washing the clothes of N. H. (No. 20), who was leaving the hospital after her attack of varicella and was incubating small-pox. M. A. J. had declined to be re-vaccinated; and the severe form of her attack, which was characterised by delirium, and terminated fatally, may have been influenced by her acknowledged intemperate habits. On November 14 a labourer (No. 22) was sent on to the hospital from the workhouse, having developed a small-pox rash on that day. He had probably contracted the disease outside Leicester. No. 24, a young man living in Leicester, but not known to have been in contact with a case, developed a rash on November 16th, and was admitted on the 18th. He was a bicyclist, and possibly was infected in the neighbourhood of the town. The next case (No. 27) was one concerning which some difference of opinion existed, the characters of the eruption being so much mortified. Its origin could not be traced.

December.—The following are the fresh infections occurring in this month and the cases connected with them:—
W. J. S. (No. 33), a lad of 13, unvaccinated, was admitted into hospital on the 21st; but he had been taken ill on the 10th, and had a copious rash, which developed into very large vesicles well out on the 16th. The case was at first unrecognised. He was no longer attending school, but lived in the Beatrice Road, the nearest part of the Newfoundpool district to the hospital, where later in the epidemic numerous cases arose. Two other cases occurred in this family, viz.:—
Nos. 44 and 59, who sickened on December 31 and January 4, whilst a neighbour (No. 69) was attacked on January 7.
H. J., æt. 8 (No. 34), one of a family of 11 children, all unvaccinated, whose ages ranged from one to 17 years, was attacked on the 11th; the rash appeared on the 13th, and the mother thinking it was "only measles," put him in a separate room and nursed him, not seeking medical advice until the 16th. How the child became infected is not known; inquiries were made at the school which he and five others attended, but no clue could then be obtained. This family was not sent into quarantine, but was visited daily for a fortnight by the inspector. Vaccination of the children was offered but refused by the parents. During the fortnight's surveillance, *i.e.*, up to December 31, no case was reported from this house. It was subsequently ascertained that one of the children had a few "spots"; and another was taken ill with vomiting and fever; but was well the next day. It was not until January 10th, 1893, *i.e.*, 24 days after the removal of No. 34, that another child, M. J., æt. 12 (No. 77), sickened. The parents considering this to be a case of chicken-pox did not inform the authorities, and kept her at home; but that the case was one of small-pox there can be no question not only from the preceding case, but from the fact that four other of the children were subsequently attacked, viz., N. J., æt. 5 (No. 114), on January 29th; E. J., æt. 4 (No. 122); on February 4; E. H. J., æt. 14 (No. 123), on February 4; and E. J., æt. 6 (No. 128), on February 12. If No. 77 were not infected from a case intermediate to her attack and that of No. 34, she may have been so through faulty disinfection of the house, or through the father visiting the hospital on January 27th, 28th, and 29th, owing to the critical state of the first child who was then in the ward.
W. C., æt. 30 (No. 35), was sent on to the hospital from the workhouse on December 15. He had been tramping to Leicester from Warwickshire during the past fortnight and arrived in the town with the rash out. No. 37 was a nurse who had been in the service of the hospital since the beginning of October. She was attacked on December 15, and was re-vaccinated on the same day; the small-pox rash appeared on the 17th, and the attack was a very mild one.
The next case in the record is that of A. J. P. (No. 38),

* There is some obscurity about this. December 1st was the 14th day of quarantine when No. 32 left; she says she was ailing then, but did not have any rash till December 9th or 10th. She may, therefore, have contracted the disease whilst in quarantine.

which, however, was not known to the sanitary authority until he was convalescent. It was then ascertained that a month previously, *i.e.*, on December 15, he had an attack of "lumbago" with fever, and kept to his house for nine days, a typical discrete rash having developed. This case was discovered owing to the admission to hospital in the beginning of January of three other members of the household, two (Nos. 53 and 61) being unvaccinated children, one of whom died after a most severe attack complicated with double panophthalmitis. No. 53 was attacked on January 3; No. 61 on January 5; and a maidservant (No. 67) on January 7, she being re-vaccinated on the 10th, a day after appearance of rash. The housekeeper (No. 94) who had attended on the children during the week of their illness that they were at home was not re-vaccinated with the rest of the family on January 10. She sickened on the 19th and was admitted on the 21st. Another case traceable to the same source is that of V. G. (No. 63), a young lady friend of No. 38, and visited by him when he was recovering from his attack. Her illness commenced on January 5; she was not removed to hospital.

Nos. 53, 61. No. 67. No. 94. No. 63.

Three members of another family, the source of whose infection was not ascertained, were attacked about this time. The first was an unvaccinated child, one year old (No. 39), who was not attended by a medical man. His illness began on December 15. On January 2nd his brother (No. 43) developed a rash, and the father (No. 48) on the 8th. A woman (No. 57) who nursed the infant when it was ill, sickened with small-pox on January 4. E. M., f., æt. 15 (No. 40), vaccinated, had a suspicious rash on December 22nd; and was first isolated from the small-pox ward. On the 28th her family was removed to quarantine, and two of them (Nos. 51, 52) sickened with mild attacks of small-pox on January 3rd. The father's quarantine was prolonged for a week, when No. 51 was admitted into the small-pox ward on the 5th; but he also developed the disease a week later, *i.e.*, on the 19th, or 14 days after his daughter was removed and 11 days after his wife had been. His attack was severe. Another family group of cases is that of the W's., living in Pool Road, Newfoundpool. Mrs. W., æt. 24 (No. 41), had a mild attack commencing on December 22. She was not taken to the hospital then, but went there with her infant on January 25, he having been attacked (No. 65) on January 6. The remaining members of thefamily—E. W., æt. 2½ (No. 96), and Mr. W. (No. 98)—were removed at the same time, having been attacked on the 20th. The children were unvaccinated; and the infant's attack was a mild one, and indeed regarded by the parents as "severe chicken-pox." The other child (No. 96) had a severe confluent attack. A young married woman (No. 42) was found to be suffering from small-pox on the 29th and was admitted to hospital. She may have infected another person who visited her (No. 60). The seventh family in which more than one case arose, to be invaded in December, is that of H.'s, discovered in the course of a house-to-house inspection of the neighbourhood. The first to be attacked was N. H., æt. 12, unvaccinated (No. 45), whose illness was very mild, and was regarded as chicken-pox. It began on December 31, and her sister, æt. 14, also unvaccinated (No. 64), sickened on January 6. They were both admitted on the 12th, the rest of the family, seven in number, being taken into quarantine. Of these three sickened, viz., No. 82 on the 16th, No. 85 and No. 87 on 17th.

No. 39. No. 43. No. 48. No. 57. No. 40. Nos. 51, 52. No. 92. No. 41. No. 65. Nos. 96 and 98. No. 42. No. 60. No. 45. No. 64. Nos. 82, 85, 87.

The case of C. G. (No. 46), who was admitted with a very mild attack on January 3rd, is of interest in regard to his infection. He had been, on December 19, to see his mother at Halifax; she died from small-pox (and apoplexy) on the 21st; and he first showed symptoms of illness on the 31st, returning to Leicester on January 2nd, visiting in the meanwhile his sister's family at Keighley.

No. 46.

F. L. (No. 47) had been engaged on railway works at Chesterfield, and on December 19th had stayed at a house where a man had small-pox. He was himself attacked on the 31st; taken to hospital on January 5th; his sister, Mrs. M. (No. 84) falling ill on January 17th.

No. 47. No. 84.

1893.

January.—Two very mild cases in a brother and sister (Nos. 49 and 81) occurred at the beginning of January, the former attacked on the 1st, the latter on the 15th. She had been re-vaccinated on the 9th, the day after the removal of her brother to hospital, but it did not take. No clue was obtained to the source of infection in No. 49 nor in that of No. 50, a young woman of 21, the eldest of a family of ten, of whom the two youngest, æt. five and six, were not vaccinated. No second case occurred in this house. A school girl, æt. 8 (No. 54), was attacked on the 3rd and admitted on the 8th; she had a severe attack, characterised in its later stages by continual re-formation of the crusts, so that it was long before the skin was clear. At this time another family had several members attacked, a circumstance which in this, as in other instances, was associated with the non-recognition of the nature of the first case. This was a lad of ten years (No. 55), unvaccinated, whose illness commenced on the 3rd, the eruption, which was discrete, appearing on the 5th. The family consisted of eight members, three of whom were un-vaccinated; and four were infected by small-pox, viz., No. 90 (vaccinated), attacked on the 18th, No. 91 (vaccinated) on the 18th, No. 93 (unvaccinated) on 19th, and No. 101 (unvaccinated) on 22nd. It was when investigating these cases that the Medical Officer of Health found marks of previous small-pox on the limbs of No. 55, whose rash had been ascribed to chicken-pox. They were removed to hospital on the 23rd and 24th, one of the cases (No. 93) being a confluent attack. Two unvaccinated children of another family (origin also untraced) were admitted in this month; the first (No. 56) was attacked on the 4th, the second (No. 89) on the 18th. A case (No. 58) in a young man, vaccinated, was received about a week after the rash appeared (January 6th); there were 8 members of his family, all unvaccinated, and no second case occurred in the house. But a fellow worker with No. 58 was attacked on January 17th (No. 86), and two others (Nos. 100 and 102) on the 22nd. The next case is of peculiar interest as presenting probably a rare instance of re-infection. Mrs. M. (No. 60) had been attending on Mrs. S. (No. 42) before her removal to hospital on December 29th; and in consequence her family was kept under observation. No. 42 had sickened on December 24, and on January 5th, *i.e.* 12 days later, Mrs. M. had premonitory symptoms;* a few shotty-like papules appeared on the skin of the back on the 6th, but there was no pyrexia, when she was admitted on the 8th. The case being equivocal, she was put into one of the detached wards adjoining a general ward, and attended by a nurse, who subsequently sickened with small-pox (No. 106). Mrs. M. miscarried on the 12th. She left the hospital on the 23rd, and was re-admitted on the 30th (No. 111) suffering from a much more definite attack, which had commenced with rachialgia, headache, and vomiting on the 28th. She now had several large discrete pustules on the face, the maculæ of the previous eruption being visible on the back. If this were not a case of re-infection, and the primary illness not small-pox, it is singular that she should previous to that illness have been in contact with a case of small-pox, and that the nurse in attendance should have contracted the disease. The evidence in support of re-infection seems to outweigh the argument that these form merely coincidences. The nurse in question (No. 106) presented a rash on January 23rd, and would therefore have been attending on No. 60 when infected. Her attack was a very mild one. She had been re-vaccinated ten years previously, but not on the present occasion. The large common lodging-house in Lee Street where two cases occurred in October and November (Nos. 10 and 19) again became infected. The first to sicken was Mrs. K. (No. 62), the wife of the manager; her illness began on the 4th January, and she was removed on the 8th, the house being kept under observation. On the 12th, *i.e.*, at too brief an interval to be infected by No. 72, one of the inmates, a man 50 years of age (No. 78), was attacked; his case was a very mild one, and he went about with the rash out, but was identified and removed on the 18th. Then follow a series of other lodgers, each infected in turn, viz., J. S., æt. 70, (No. 109), a man who bore the marks of re-vaccination done 40 years before; when he first ailed about 28th January, he was sent to the workhouse infirmary, but spots appeared on February 1, and he went to hospital on the 3rd. Re-vaccination had been offered to the inmates of the lodging-house, 102 in number, but declined by all. Another inmate, F. R., æt. 20 (No. 112), sickened on the 28th January; he was vaccinated (one large scar), but had a severe confluent attack. J.U., æt. 52 (No. 132), who had been re-vaccinated 20 years before, had a very mild attack, which commenced on February 16; he was removed on the 25th, the case not being at first recognised. He apparently infected four other inmates:—No. 141, attacked March 11, No. 142 March 5, No. 144 March 8, No. 145 March 8, No. 146 March 9 (who went to the workhouse on the 11th and was transferred thence to the hospital), and the final case of the series was that of B.F., æt. 62 (No. 151), who was attacked on March 22. No other cases occurred in this lodging-house after this.

No. 55. No. 90. Nos. 91, 101. Nos. 86, 102. No. 60. No. 106 No. 62. No. 78. No. 109 No. 112 No. 132 Nos. 141, 144, 145, 151.

No. 49 and 81. No. 50. No. 54.

* I find in my notes that Mrs. M. visited Mrs. S. on the 22nd, and not again until the 27th. If she really were infected by the latter the infection must either have been received before Mrs. S. showed any signs of illness, or the incubation period of Mrs. M.'s case must have been unduly short.

Reference may also be made to the cases sent to the hospital from the workhouse. Besides Nos. 1, 4, 22, and 35 which arose in August, September, and November, there were in January two cases, Nos. 68 and 99; in February two, Nos. 118 and 125, and in March 146 and 154. It will be convenient to deal with these now. They were not connected with one another, and were mostly men who had come to Leicester on tramp. No. 68 was in the Union for about four days with a few papules on him; the onset of his attack being on January 7th, and the rash had been out about nine days before he was sent to the hospital. No. 99 probably contracted the disease at Bromsgrove, whence he had tramped to Leicester; his attack was extremely mild, barely half a dozen papules. He had three scars of re-vaccination in addition to three on each arm of his primary vaccination. No. 118 had come from London to Leicester; he also had been re-vaccinated (two years before) and had a very mild attack. No. 125 had previously been in a lodging-house in B—— Street, where it is supposed he was infected. No. 146, as stated, was infected at L—— Street lodging-house, and went from there to the workhouse infirmary. No. 154 had been tramping from Cambridge to Newmarket at the time of his presumed infection.

M. V., æt. 20, a wardmaid at the hospital who had declined to be re-vaccinated, sickened on January 7 (No. 66). On the 8th her temperature was 104°, on the 9th the rash appeared, and the pyrexia abated. The eruption was composed of papules of various sizes, mostly discrete. She had four large foveate vaccination scars on the left arm.

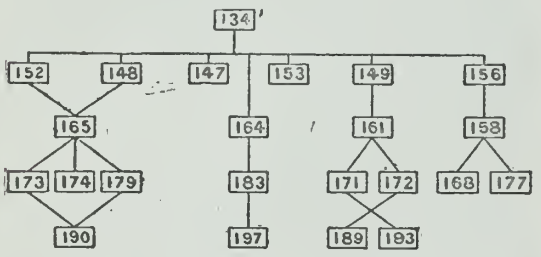
G. L. (No. 70), æt. 23, may have been infected at a public-house, where he mingled with several people a fortnight before he himself took ill on January 8. He had a proper coherent rash, but the papules instead of really maturating on January 20, became more consolidated and pale. He had four vaccination scars. No. 71 was a child, æt. 5, who had been attending school with a rash out on him, which was found by Dr. Priestley to be small-pox. The papules were small and discrete; the child was unvaccinated. No. 72 was another child, 8 years of age, who attended the same school as No. 55, and as in that case, so here, the diagnosis was not made until another member of the family had sickened (viz., No. 104, a child of five, whose rash appeared on the 28th). It was then found that No. 72 presented evidence of having had small-pox, his rash appearing on the 11th (that of No. 55 had come out on the 3rd). Later, a third member of this household (No. 126), a young woman æt. 21, sickened on February 9, and had a mild attack. S. C., another unvaccinated child (No. 73), was attacked on the 9th, and admitted on the 12th. There were three other unvaccinated children in the family, but they did not contract the disease. In this case the pustules were remarkably large, prominent, and surrounded by wide areolæ. No. 74 was a friend of Mrs. S. (No. 42), and was in her company on the 26th December (No. 42 was then sickening); the rash in her case, a discrete one, appeared on the 12th January, her illness beginning on the 10th. No 75 is the case of a young man which was not discovered till the mild attack from which he suffered had passed; it had commenced on the 9th, and he had remained at home. Another case treated at home is that of No. 79, a medical practitioner; but it was so slight, and recovery so rapid, that it has only been included in the list with some hesitation. No. 76, who sickened on the 9th, No. 80 on the 13th, and No. 83 on the 16th, were also mild cases, of which the origin could not be traced. No. 80 was living at a lodging-house with 48 other lodgers, none of whom were attacked. Next to be mentioned are three members of a family, of which the first to be attacked was a schoolboy (No. 88) (? attending same school as Nos. 55 and 72), who sickened on the 17th, and was admitted on the 19th. He was unvaccinated, and had a severe confluent attack. Two other unvaccinated children escaped; but No. 119, a lad of 16, vaccinated, had a very mild attack, commencing on February 2; and the father, æt. 35 (No. 124), also vaccinated, sickened on February 4, for a mild attack. On January 20 I accompanied Dr. Priestley to a house in B——Street, where an infant (No. 95) had just died after 24 hours' illness. It presented some subcutaneous petechiæ, and was regarded as a case of malignant small-pox. There seemed to be some connexion between this case and Nos. 42 and 74, with whom the family was acquainted; and the child's father bore equivocal traces of a recent eruption. He had not, however, been ill. A child, 7 years of age, neighbour to the A. family (two of whom had had small-pox, viz., No. 56, removed on the 7th, and No. 89 on the 20th), sickened on the 20th. This child (No. 97) was unvaccinated; her attack was a very mild one. Nos. 103 and 107, who were attacked on the 22nd and 28th respectively, were cases the origin of which could not be traced. No. 105, an unvaccinated girl of 12, who had a severe confluent attack, accompanied by hæmorrhage, attended the same school as No. 88. Her illness began on the 37th, ten days after No. 88 sickened. The case of No. 108, a girl of 14, was clinically interesting. She had developed a very scanty eruption on the 27th, and had a very mild attack, *quoad* small-pox; but three weeks later symptoms of meningitis supervened, and for some days her condition was critical. Although it seemed probable that she contracted the disease when going to or engaged at her work (which she had only resumed after eight weeks' absence for "rheumatism" on January 14th), no prior case known to have been in contact with her was discovered. An unvaccinated child (No. 110), æt. 4, who sickened on the 28th, may have been infected a fortnight previously by a visitor coming from a house where small-pox then was. The child had just then been attacked with scarlet fever. It was admitted to hospital on the 3rd February, and died on the 8th. Its mother (No. 130), had a very mild attack, which commenced on February 56, *i.e.*, the 14th day of the child's removal. No. 113 was visiting near infected houses on the 15th, and was attacked on the 29th; Nos. 115 and 117, attacked on January 29 and 31, could not be traced; whilst No. 116, who also fell ill about the same time, may possibly have been infected when engaged in some plumbing work on the hospital premises. He was, however, only engaged on the part most remote from the small-pox wards.

No. 108. No. 110. No. 130. No. 113. Nos. 115, 117, 116.

February.—The first case in this month's record is another which was untraced, a man, æt. 30 (No. 120), whose illness commenced on the 3rd: he was admitted on the 8th and had a very slight attack. B. G., æt. 7 (No 12), had been staying with some relatives a fortnight previous to his attack, which began on the 4th. In the course of his inquiries the medical officer found several children in this house suffering from chicken-pox, and also evidences of a case of small-pox which had passed unrecognised. No. 121 apparently infected his sister N. G., æt. 5 (No. 131), before his rash appeared, for she fell ill on the 16th. Both these children had confluent attacks. They were unvaccinated, as also was another child who escaped; but two other members of the family were vaccinated (primarily) on the appearance of small-pox in the house. No. 127, who sickened on the 11th, probably contracted the disease outside Leicester, where she had only been visiting for a week previous to her illness. A schoolboy (No. 129), æt. 7, was attacked on the 12th. How he contracted the disease is not known; but he apparently infected his father (No. 136), who sickened on the 27th. There were four other unvaccinated children in this family. No. 133, a child of two years, sickened on the 18th; he had a coherent attack, complicated by bronchitis. There was a history of mild feverish illness in a relative living next door about three weeks previously, but no tangible evidence that the child had been infected there. His father, however (No. 143), was attacked on March 7th. A series of cases occurred in three families about this time, which were not known to the authorities until some weeks had elapsed. They commence with the case of G. H. (No. 134), æt. 29, who was taken ill with headache and pains in the back on the 21st, followed by a sparse eruption on the arms, wrists, ankles, and forehead. His child, æt. 4, unvaccinated (No. 147), was feverish and delirious on March 11th, and also had an eruption like his father; the wife (No. 148) complained of pains in the head and back on March 13th; and her infant (No. 152), whom she was then suckling, was taken ill a week later. Both children were unvaccinated, and in both the variolous rash was sparse. J. W., æt. 30 (No. 153), a lodger with this family, was attacked about the same time as the infant. These five persons comprised the whole household; but from this source five other households were invaded. C. P., æt. 16 (No. 149), was in the habit, together with her brother F. P. (156), of taking her dinner with the H. family. She had premonitory symptoms about March 19th, followed by a very scanty eruption. F. P. was taken ill a week later than his sister, and their mother (No. 161) was in bed for two days with headache and backache, about a week after F. P. was ill. She had been re-vaccinated in 1872. Then Miss H. B. (No. 158) who "walked out" with No. 156, also had an eruption on the face and arms about March 29th. This case was notified and admitted to hospital about the 23rd day, but two other members of the family were attacked, viz., No. 168, a girl of 8, who sickened on April 8, and had a coherent attack, and No. 177, a girl of 16, who sickened on April 12th, and had a discrete attack. Nor does this conclude the series of cases ascribable to infection from No. 134; for A. M., æt. 10 (No. 171), and F. M. (172), unvaccinated children, who had fairly mild attacks, were grandchildren of Mrs. P. (No. 161), and sickened on April 10; they infected their mother (No. 189), who fell ill on April 23, and their unvaccinated sister (No. 193), æt. 3, attacked on the 26th. This last was the most severe

No. 121. No. 131. No. 127. No. 129. No. 136. No. 133. No. 143. No. 134. No. 147. No. 148. No. 152. No. 153. No. 149. No. 156. No. 161. No. 158. No. 168. No. 177. Nos. 171, 17 No. 189. No. 193.

case of the whole series. Another family apparently infected from the same source is that of T. B., who was a fellow workman with No. 134, and acquainted with the P.'s
No. 164. (No. 156, &c.). He (No. 164) had a mild attack, which was not notified and was thought to be influenza. His illness commenced on April 3rd, and of his three unvaccinated children, two had small-pox. The one, L. B., æt. 5
No. 183. (No. 183), was attacked on April 17th, probably infected
No. 197. by him, the other B. B., æt. 5 (No. 197), attacked April 29, and probably infected by her sister. Again, the G. family were apparently infected through the father, being also a co-worker with No. 134. The first of his family to
No. 165. be ill was Mrs. G. (No. 165), who had taken charge of the infant H. (No. 152) when its mother was ill. No. 165 sickened on April 4, and two of her unvaccinated children,
Nos. 173, 174. (Nos. 173, 174) on the 10th; whilst the father (No. 179)
No. 179. sickened on the 14th, and a third child (190) on the 24th.
No. 190. Thus more or less directly connected with the unrecognised case of G. H. (No. 134) were six families, or a total of 37 persons, of whom 23 were attacked with small-pox (nearly all mild cases); whilst of 12 of them who were unvaccinated 10 were attacked. (*See* diagram.)



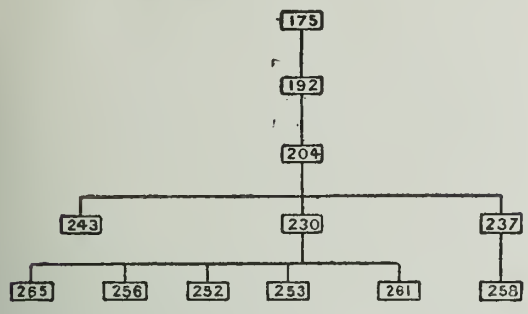
No. 135. Mrs. H. (No. 135), æt. 26, unvaccinated, had a severe semi-malignant attack. She lived in a house adjacent to one where several cases (Nos. 34, 77 &c.) had been occurring; she sickened on February 25th, and was removed on the
No. 155. 27th. Her husband, æt. 28 (No. 155), also unvaccinated, was sent into quarantine with his three children. He was probably infected there, as he did not sicken until March 26th, *i.e.*, 12 days after leaving quarantine. His children, æt. three, six, and nine years, all unvaccinated, did not take the disease.

March.—Several cases were imported into Leicester during this month, but in no instance did they give rise to
No. 137. others. No. 137 attacked on March 1st, in a lodging-house, probably contracted the disease in Northampton. He was in the Militia, and stated that he had been re-vaccinated six years previously, but the evidence of this was very equivocal. His attack, which was a confluent one, did not run a typical course, but absorbed at the stage of
No. 138. maturation; the pustules rapidly desiccating. No. 138, attacked on March 1st, had arrived in Leicester on February 23 from Sheffield. She was an unvaccinated child, æt. 7, and had a mild attack, and contracted scarlet fever when
Nos. 139, 140. in hospital. Nos. 139 and 140 were fellow labourers, who had arrived at Leicester from Derby on February 20. They
No. 150. both sickened on March 6th. No. 150, a fortnight before his attack on March 21st, was in London or Oxford; and
No. 157. had only been at Leicester for four days. No. 157, attacked on the 27th, lived in the Newfoundpool district, where so large a proportion of cases subsequently occurred.
No. 159. The origin of the attack of No. 159 is obscure, for she had remained in her house during the preceding weeks, except on the one occasion a fortnight before when she went to the railway station to meet her husband. She was attacked
No. 160. on March 28th. No. 160, who fell ill on the 29th, had been to the hospital on the 15th to meet her sister (No. 123), then leaving the building.

No. 162. *April.*—No. 162 was a "missed" case. He had felt ill on the 2nd, and a rash appeared on the 4th; but the case was not known until the following month when others were traced. It is possible that his child, who died from "convulsions" two or three weeks after his illness, may really have had small-pox. Probably connected with this
No. 191. case is that of No. 191, an unvaccinated lad of 13, who on April 11th delivered coals at the house, and who sickened on the 25th. He had rather a severe attack, being removed to hospital on the 27th. One of his brothers,
No. 209. æt. 10 (No 209), sickened on May 10, and another, æt. 6
No. 218. (No. 218), on May 13. Both were unvaccinated, the former having a confluent, the latter a discrete attack. Another
No. 202. case possibly traceable to No. 162 is that of No. 202 (May
No. 163. 3) who lived close by. No. 163, attacked on 3rd April, attended the same school as some other children previously mentioned (viz., Nos. 88, 105, &c.); he was unvaccinated, as also were the five other children of the family, who, together with the mother, were taken into quarantine for two days, whilst their dwelling was being cleansed and disinfected. One of them, R. H., æt. 11 (No. 185), sickened No.
on the 19th and died from hæmorrhagic small-pox on the 25th. A family of whom four members were attacked is that of the M.'s. The first to fall ill was E. M., æt. 21 (No. 166), an unrecognised case, his illness commencing No.
on April 5th. Both the unvaccinated members of this family suffered; one, B. M., æt. 9 (No. 182), sickened on No.
April 16, and died from hæmorrhagic small-pox on the 24th. The other, E. M., æt. 6 (No. 187), sickened on the No.
20th; his attack was a coherent one. Miss L., æt. 25 (No. 186), also living in the house, was attacked on the No.
19th. It seems clear that the malignant case had a briefer incubation period than the others. Three other persons No.
connected with these cases suffered. One (No. 201) was employed at the same factory as No. 165, who had continued at her work with the eruption on her until April 20. No. 201 had a very mild attack commencing on May 2. No others in this factory seem to have been infected. Nos. No.
203 and 210 were undertaker's assistants and had been No.
engaged in the burial of No. 182 on April 26. Both were unvaccinated, and the incubation period of No. 203 was unusually short (nine days) if he then contracted it, for he sickened on May 5th; but possibly, as Dr Priestley suggested, his was a case of direct inoculation. No. 210 sickened on May 10th, *i.e.*, 14 days after this presumed exposure. I now come to a series of cases traceable to infection from a common source—a navvy (T. S.), who escaped observation and whose assumption of an alias made the task of clearing up the etiology of other cases somewhat difficult for the authorities. No. 167 lodged with this man, No.
and became ill on April 7th, Mr. and Mrs. H. (Nos. 169 Nos
and 170), with whom they lodged, also falling ill on the 10th. A young woman (No. 178), who came in to assist No.
Mrs. H. in her household duties, sickened on the 13th. This patient had a coherent attack. [Although she presented a smooth scar on the arm it did not appear to be distinctly of vaccinal origin; and she stated that her mother had told her she had never been vaccinated.] G. B., æt. 33 (No. 180), the foreman of the works where "T. S." had No.
been employed, was attacked on April 14, and two of his three unvaccinated children who were infected by him died from small-pox. One, G. B., æt. 16 months (No. 194), No.
sickened on the 26th. He had double panophthalmitis and gangrene of feet, and died on the 17th May. The other (No. 198), L. B., æt. 3, sickened on the 30th, and died No.
after a prolonged attack with double panophthalmitis and deep ulceration of the face on June 27th. When "T. S." left the H.'s lodgings he seems to have gone (under an alias) to another house, where he lodged with the foreman of some other works from April 24 to May 15. This man (No. 217) was attacked with small-pox on May 13; he had No.
a severe confluent attack, complicated by delirium tremens and pneumonia. He had two vaccination marks. His son, No.
æt. 15 (No. 219), was with other children vaccinated (primarily) on May 16, and sickened with small-pox on the 17th. The attack was a mild one, and when I saw him he was covered with small, miliary, red papules, and the two vaccination vesicles were well marked. [We were told that this lad when two years old was "inoculated" by his mother from the arm of his recently vaccinated sister; but there was no cicatrix to show that this had been at all effectual.] A lodger in the same house, æt. 23 (No. 207), No
was attacked on May 8, and had a coherent eruption, which dried up rapidly. He had three large foveated vaccination scars.

Mrs. M., æt. 28 (No. 175), was taken ill on April 10 No
with what was thought to be influenza. Her parents, Mr. and Mrs. B., lived hard by, and her married sister, Mrs. W., in the town. Mrs. B., æt. 56 (No. 192), had a slight illness, No
for which she kept her bed for a few days, from April 25; her husband (No. 204) also took ill with "influenza," No
which he was thought to have contracted from his wife, his attack beginning on May 6, and he kept his bed for 10 days. The real nature of these cases was revealed by the illness of Mrs. W. (No. 230), who sickened on May 25, No
developed a rash on the 27th, notified as small-pox on June 2nd, and removed to the hospital on June 1st. Her husband (No. 253) was attacked on June 9th, and their two No
unvaccinated children: No. 252 on the 8th, No. 261 on No
the 12th, the latter being a confluent case. A neighbour, No
Miss B., æt. 17, also sickened (No. 256) on the 10th June. No
[This case was a remarkable one in a vaccinated subject. The rash was most copious and confluent, but in four days it began to dry up, and there was no secondary fever; so that she was out of bed in a fortnight.] The brother of Miss B. sickened on June 13th (No. 265), and was pro- No
bably infected by Mrs. W. In addition to these cases traceable to infection from Mr. B. (No. 204), there was the case of Mrs. G., æt. 52 (No. 243), a neighbour to the No
M.'s, who sickened on June 1st; whilst Mr. M. himself

(No. 237) was attacked on May 28th, and sent to hospital on June 1st, and his child (No. 258) on June 13



Of the rest attacked during April, Nos. 176 (attack on the 11th) and 184 (on the 17th) were navvies at work together on a sewer, and small-pox occurred amongst others of those employed. No. 181 had been at an athletic meeting a fortnight before he sickened, April 16, and may have contracted the disease there. The source of the illness of No. 188 (April 23) could not be discovered. Miss E. B. (No. 195), a schoolmistress, unvaccinated, was attacked on April 27th. She had recently returned from a visit to Coventry, where she was nursing a friend who was said to have "chicken-pox." There can be little question that she here contracted the disease, which she had in a severe confluent form, followed by extensive pitting of the face.* Next come a series of cases which arose at T——, a village near Leicester, whence a case (a man engaged on sewer works) had been taken into the Leicester Hospital, about the 11th April. B. S., æt. two years, unvaccinated (No. 196), living in this village, contracted the disease from her father, and besides her his wife sickened later, as well as another child. B. S. was sent in to Leicester to stay with her grandmother, who kept a sweetstuff shop, where she was found by the medical officer in his inquiries into the origin of another case. No. 196 was attacked on the 28th, but not admitted to hospital until after maturation of the rash, viz., on May 9th. E. S., f., æt. 16 (No. 222), and J. S., m. 14 (No. 223), both unvaccinated, contracted it from their niece, sickening on May 19th (confluent attacks). No. 208, a boy of six, who frequented the shop, was also infected by No. 196; he sickened on May 10; and a like origin may be ascribed to the attack of No. 224 (May 20), who visited the house and saw B. S. with the rash full out. The origin of the illness of E. H., æt. 16, a bricklayer (No. 199), who sickened on April 30, is not ascertained. He lived in Newfoundpool. He was unvaccinated, and had a discrete attack. His father (No. 220) fell ill on May 17th, the last day of the "quarantine" supervision. A fellow worker (No. 251) with these at new buildings in the district was attacked on June 8th. He was 28 years old, unvaccinated, and had a coherent attack. [He stated that his mother was suffering from small-pox at the time of his birth.]

May.—Several "single" cases in households occurred during this month, and most of them not traceable to previous cases. No. 201, however, who was attacked on May 1st, was a wardmaid at the hospital who had declined to be re-vaccinated. Her attack was a very mild one. No. 205 sickened on the 8th; he may have been infected in London, where he had recently been. No. 206, attacked also on the 8th, was engaged at work in Newfoundpool. No. 211, unvaccinated, attacked on the 10th, possibly contracted small-pox in the course of cycling excursions. He had a confluent attack. No. 212, a boy of 7 years, was attacked on May 11, origin not traced. He did not go to hospital till the 17th, and a playmate of his, E. C. (No. 239), sickened on the 29th, and her brother on June 13th. K. G., æt. 9 (No. 213), the child of a lodging-house keeper, sickened on the 11th. There had been other cases amongst children attending the same school. She was unvaccinated, and her attack was a discrete one. Her infant brother (No. 238), who caught it from her, was attacked on the 29th, his case being a coherent one. A child from another house (No. 233) was with No. 213 when she was at home suffering from the rash, viz., May 13 to 16; and he (No. 233) sickened on the 27th. No. medical man had been called in to K. G. until maturation of the pustules had occurred; and the same happened in the case of C. G., æt. 5, who sickened on the 11th, and was admitted on the 17th. This child (No. 214) lived at a tavern, but the source of her illness was not ascertained. Similarly there was no evidence of the origin of the case of No. 215, an unvaccinated youth, who had a confluent attack commencing on May 11th, and of No. 216, an unvaccinated child of five years, who was desquamating from scarlet fever when admitted, and who had quite a mild attack of small-pox beginning on the 11th. He was taken into hospital on the 16th, and his father (No. 240) was attacked on the 30th. Six mild cases occurred in a family of seven, arising probably from the visit of one of the hospital staff to the house about some dressmaking. These cases (Nos. 221, 244, 245, 246, 247, and 248) will be referred to subsequently. No. 225, whose attack commenced on May 20, the rash appearing on the 22nd, was not admitted to hospital till the 26th. He was an unvaccinated child of 5 years, and his confluent attack was complicated with dysenteric symptoms. He lived at Newfoundpool. Another unvaccinated child, æt. 7 (No. 226), who sickened on the 21st, had a discrete attack, not traceable to a preceding one. Mrs. M. (No. 227), living in the centre of the town, had a mild attack which began on the 23rd. How she contracted it is not known, possibly in the course of her vocation as a Scripture reader. A next door neighbour, A. A., f., 27, sickened on June 7th (No. 249), Mrs. M. not going to hospital till May 29. No. 228, an unvaccinated child of 10, who had a confluent attack, may have been infected at her village T., where other cases had recently occurred; she was, when attacked, staying with her sister in Leicester. Mrs. D. (No. 229) was an "unrecognised" case, and never came into the hospital; she was ailing on May 24, and had some spots thought to be chicken-pox; but her husband (No. 255) was attacked with small-pox on June 10. No. 231, a Newfoundpool case, was also overlooked, and was not admitted until convalescence had set in. L. P., æt. 8, unvaccinated (No. 232), lived next door to a house whence six weeks before some cases had been removed. She sickened on May 27, and was removed to hospital on the 31st, when the house was fumigated, the bed removed and disinfected, and returned to the house on June 2nd, when it was occupied by Mrs. P. (No. 272), who was taken ill on the night of June 16, *i.e.*, 16 days after the child had left. No. 234, a confluent case in an unvaccinated adult, and No. 238, a severe discrete case in a vaccinated adult, were fellow labourers at W., a suburb of Leicester, where cases were known to be present. No. 236, an unvaccinated adult, the foreman of some sewage works, and alcoholic inhabits, sickened of confluent (malignant) small-pox on the 28th May, and died on June 8.

At my visit on June 29, Dr. Priestley took me to see G. W. R., æt. 23 (No. 241), a young man, vaccinated in infancy, who had recently passed through a brief illness attended by a rash, the maculæ of which on the face and limbs seemed to be unequivocal. He had not felt well on May 29, and spots had appeared on the 31st. Subsequent to this seven out of the remaining eight members of his family—all but two of them had been vaccinated in infancy—had illnesses which could only be small-pox, although in several the eruption was extremely sparse. One, L. R., f., 21 (No. 263), sickened on June 13, two—H. R., 8, and E. R., 12 (Nos. 267, 268)—on the 14th, the relative sparseness of the rash being concordant with their ages. K. R., æt. 14 (No. 257), sickened on the 11th, *i.e.*, on the 13th day of her brother's illness. Of the two unvaccinated children, A. R., f., 2 (No. 262), took ill on the 13th, and had a coherent attack, followed by abscesses, and M. R., f., 7, on the 19th, had a severe discrete attack; whilst G. R., æt. 51 (No. 270), whose illness began on the 17th, had a mild discrete attack. No. 242, a young woman of 19, sickened on May 31st; but it is not known where she contracted the disease.

June.—During this month out of a total of 25 newly-invaded households, 14 were in the Newfoundpool district, and, with hardly an exception, the very thorough and searching inquiries made by the medical officer and sanitary inspector failed to trace the origin of the first cases arising. This fact is the more striking in view of the remarkable manner that many a history had been unravelled and the disproportionate incidence of the disease on the community of the district led Dr. Priestley to surmise that the infection proceeded from the hospital, possibly by aërial diffusion or through mediate agencies. There are 18 cases in this group of which one, already mentioned, No. 251, may have been infected by a fellow-workman. The remainder fell ill on the following days: June 12th, one case; 15th, one; 17th, one (and two later cases in the house) sickening on the 23rd and 29th respectively; 18th, two; 19th, two; 21st, one; 23rd, four; and 30th, one case. In two instances besides that above noted, a later case arose in the house. One of these was remarkable in the fact that the second case (No. 345), the father of the first patient was not attacked until November 20th, whereas his child (No. 243) had only been in hospital from June 27 to July 13. Clearly this was a re-infection of the

* The case of this young woman has been referred to in evidence given before the Commission. (See evidence appended to the Commissioners' Fourth Report, Questions 13,133–44 and 14,674–90.)

house or No. 345 had contracted the disease from a fresh outside source. In the other instance the first outside case (No. 290), an unvaccinated infant, sickened on June 30, but the case was not known to the authorities until August 8, when, together with a second case, an unvaccinated child of three (No. 299), who had sickened on July 14, it was removed to the hospital. These cases had infected two others living in another house, viz., Nos. 315 and 316, who were attacked on August 13th, both unvaccinated children, one a discrete the other a confluent case.* Of the cases arising in the town during the month, five were connected with previously occurring cases and have been already noted. There remain six, all in separate houses, and in none of which was the origin clear. These are, No. 254, a young man of 20, unvaccinated, illness began on the 10th; No. 60, an unvaccinated child of ten years, attacked on the 12th; No. 266, an unvaccinated child of seven years, on the 13th; No. 277, M., æt. 20, vaccinated, who had a mild discrete attack beginning on the 19th; No. 286, a girl of 18, who may have been infected by visiting a dressmaker's in Newfoundpool, although no case was in the house), and who had a mild attack starting on the 26th, and No. 287, a case open to much doubt as to its nature, in a woman of 47, whose rash appeared on the 28th, but took an anomalous and chronic course, and whose case was not notified until August 1st.

No. 290. Nos. 315, 316. No. 250. No. 260. No. 266. No. 277. No. 286. No. 287.

July.—In this month of 16 newly-invaded houses, 11 were in the Newfoundpool area, and apparently not directly connected with any preceding cases, although, of course, it would be difficult to disprove such connection in a restricted community like this. In only one instance did more than one case occur in the house. No. 302, æt. 29, had a mild attack beginning on the 25th July, and not removed to hospital till August 2nd, six days after the rash appeared; and No. 313, one of two unvaccinated children in the family of five persons, was attacked on August 13, with confluent small-pox. Probably connected with these cases are those of Nos. 319 (sickened August 30), and 320 (August 31) whilst No. 319 infected an unvaccinated child of nine (No. 328), who had a confluent attack commencing on September 18. The nine other cases occurring in this month were in eight households; one, No. 292, attacked on the 2nd, was discovered at home a week later and removed to the hospital. Another, No. 294, an unvaccinated subject, æt. 23, sickened on the 5th, and was admitted on the 11th; he had a coherent attack. No. 295, a young woman æt. 29, sickened on the 6th, and may have been infected by having been in the vicinity of the hospital or by calling at invaded houses. Her attack was a very mild one. No. 296 was an even milder case, not admitted to hospital. It began on the 6th. No. 297, a woman (vaccinated) of 45, was attacked on the 8th. It was elicited that 14 days previously she had attended a patient who was certified to have died from "typhoid" after an illness of three days, characterised by a profuse eruption and by violent delirium. If this account be correct the case could not have been enteric fever, and hardly anything else but malignant small-pox. No. 297 had a confluent attack, which, however, "dessicated," and though accompanied by secondary fever, was only followed by slight pitting, but by most extensive staining of skin. [She had two very faint scars on the left arm; and Dr. Priestley, from his experience of other similar cases in vaccinated subjects, felt sure that she could not have been unvaccinated] Another vaccinated subject who had a rather severe attack was No. 305 (f., 31), who sickened on July 26. It was not ascertained when she contracted it. The eruption in her case, although very profuse, did not pustulate to any extent, and what pustules did form were remarkably small. Her sister (No. 310), who had been re-vaccinated on the 31st, one insertion taking, sickened on August 9th, with a very mild attack. Allowing for the usual period of incubation she must have been infected on the very day the first symptoms occurred in No. 305. Nos. 307 and 308, attacked on the 28th and 31st respectively, were both mild cases, the former passing unrecognised at the time and not admitted to hospital.

No. 313. No. 319. No. 320. No. 292. No. 294. No. 295. No. 296. No. 297. No. 305. No. 310. Nos. 307, 308.

August.—Only eight houses were newly invaded in this month, four being in Newfoundpool; but of these three were traceably infected from previous cases. The remaining four households yielded nine cases. E. H., f., æt. eight months, unvaccinated (No. 311), and G. O. H., æt. 20, vaccinated (No. 312), were both attacked on the 10th, the infant dying in the hospital on the 22nd. On inquiry Dr. Priestley found Mrs. H., about 14 days before their illness, had also been ailing, and that she had a few "spots" which had left stains, but no medical man was called in. It is possible that she infected her husband and infant, but her case has not been included in my list. No. 314 is the case of a young woman which occurred about this time but of which I had no details; she remained at home, and had a very mild attack. No. 317, an unvaccinated child of eight years, had a discrete attack, marked by unduly large pustules. She sickened on the 21st, and had been away from Leicester between the 5th and 12th, the period when she was probably infected. No. 318, a married woman 22 years of age, was living with her parents and four sisters in an ill-kept house in a court, when she was attacked with small-pox on the 26th. She was removed to the hospital on the 2nd September, the day after the rash commenced to fade. Each of her sisters and a lodger contracted the disease (Nos. 324, 325, 326), sickening on the 11th September, and the other (No. 327) on the 12th. Two were unvaccinated, C. F., æt. 14 (No. 324), and C. F., æt. 7 (No. 325); the former had a coherent rash, the vesicles being as large as peas, and she also had symptoms of laryngitis; the latter had a most profuse confluent eruption. The remaining two, E. R., æt. 19 (No. 326), and E. F., æt. 10 (No. 327), who both bore large foveated vaccination scars, had extremely mild, a febrile attacks; that of E. F. of such a doubtful character (only three or four spots in all), that she was kept isolated from the small-pox patients. The origin of these cases could not be traced, but the infant daughter (No. 331) of No. 318, who had been sent to another house, sickened on September 21st, and was probably infected through her mother, who was suckling it, when she took ill, by No. 327, who visited the child on September 5, and again on the 12th, the latter date being that on which E. F. herself first ailed. This infant, who was unvaccinated, had a mild attack.

No. 3 No. 3 No. No. No. No. No. No.

September.—Only four fresh centres occurred in this month, yielding six cases, the sources of infection in each of the four instances being unknown. No. 321, a girl of 9, unvaccinated, sickened on the 3rd; she had a confluent attack complicated by purulent conjunctivitis. No. 322, f., æt. 12, one of a family of six unvaccinated children, was attacked on the 6th; her illness was a mild one. Her sister, æt. 10 (No. 329), who had shared her bed, was attacked on the 20th—a very severe confluent case—and the mother, æt. 45, (No. 332), attacked on the 21st. It is noteworthy that another child as much exposed to contagion from No. 322 as was No. 329, did not contract the disease. No. 323, f., æt. 17, had a mild attack commencing on the 11th, her brother having been taken ill with typhoid fever about the same time. No. 330, æt. 28, also a mild case, sickened on the 20th.

No. 1. No. 2. No 9. No 12. No 23. No 30.

October.—Six households were invaded in this month, yielding 11 cases; in two instances the first arising case being unrecognised, and in one that case not having medical attendance. No. 333 (a man, æt. 42), lived in a street previously free from cases, and the source of his infection could not be ascertained. His attack, a mild one, began on the 10th. No. 334, a youth of 17, whose illness commenced on the 6th, did not leave off work, and when subsequently seen presented a few characteristic pits and stains on the skin. One of his unvaccinated sisters, æt. 10 (No. 340), sickened on the 28th; her attack being a discrete one; and another, æt. 8 (No. 342), apparently infected by No. 340, fell ill on November 13th, and had a coherent attack. No. 335, Mrs. S., æt. 22, had a mild attack commencing on the 9th, and was not medically attended; her unvaccinated infant, (No. 338), was attacked on the 20th, and admitted into hospital on November. 3rd. His attack was a severe one. The other inmates of the house consisted of the father (who was re-vaccinated) and three male lodgers under 19 years of age, all vaccinated. The case of Mrs. B. (No. 336) passed unrecognised, her illness commencing on the 10th, and a rash appearing on the 12th. Her child (unvaccinated), æt. two years (No. 341), sickened on November 2nd, and had a confluent attack, for which he was removed to hospital on the 6th, his father (No. 343), æt. 30, falling ill on the 20th November This man, who had two vaccination scars on the left arm, had a confluent attack. No. 337 (f., æt. 25), was an assistant in a large drapery establishment. It is not known how she contracted the disease, which began on the 14th October; but all the other employées (19 in number) in the establishment were forthwith re-vaccinated. No second case arose among them. No. 339 is a fatal (semi-malignant) case in an unvaccinated woman æt. 29. Her illness (the origin of which was not traced) commenced on October 27th, and terminated on November 10th.

No 33. No 34. No 40 No 35. No 38 No 34 No 37. No 39

November.—Of the six houses freshly invaded in this month, three were in Newfoundpool, and yielded seven cases, as follows:—No. 347, an unvaccinated child of six,

No 347.

* Since writing the above I have seen a short account of the Newfoundpool outbreak published by Dr. Priestley, which sums up the whole argument in favour of the infection of the district from its vicinity to the hospital; and I propose to append this to the report.

was attacked on the 21st; and was removed to hospital on the 24th. Her mother (No. 355), æt. 27, also unvaccinated, sickened with severe symptoms on December 6th, and was at once removed to an isolation ward at the hospital, when on the 8th she developed a profuse rash, which became afterwards confluent. Her infant, seven months of age, was not infected. No. 348, a girl of seven (unvaccinated), sickened on the 22nd and died on the 26th from malignant small-pox. She could not be removed to the hospital, but her two sisters were attacked on December 3rd, *i.e.*, 12 days after her illness began. Of these two, one (No. 351), æt. 19, vaccinated, had a mild attack, only five or six spots on the arms and face; the other (No. 352), æt. two years, unvaccinated, died in the hospital on December 7th, with hæmorrhagic small-pox. No. 350, f., æt. 42, vaccinated, had a coherent attack commencing on November 30th, and it is singular that precisely 14 days before she had been given a letter sent from Bradford to her mother containing information of her sister's death from small-pox, the letter having been sent by the person from whose house the patient had been removed on October 25. It would be difficult to prove that a letter thus transmitted could be carried about for a fortnight, and only infect a third person to whom it was shown at the end of that period. Seeing the recent prevalence of small-pox in the neighbourhood, it is hardly necessary to seek an explanation for the attack of No. 350 in what was most likely only a curious coincidence. The child of this patient (No. 354) sickened on December 12, and had a confluent attack.

The remaining cases arising in November are No. 343, m. æt. 18, attacked on the 16th; No. 346, f.. 20, on the 21st; and No. 349, m., 19, on the 27th. This man was a soldier on furlough from Chatham, where he had probably been infected, for there was a small epidemic in that town at the time not far from the barracks. It was ascertained that his re-vaccination on entering the army "did not take"; and certainly he only bore three primary scars.

December.—Only three houses were freshly invaded in this month—one at Newfoundpool and the others in opposite quarters of the town. They yielded three cases (Nos. 355 to 357), the origin of which was not determined.

For the map appended to this report, indicating the position of the houses infected during the outbreak, I am indebted to the Health Department.

The Fever Hospital Staff.

It will have been observed that six persons employed at the hospital contracted small-pox, viz., No. 13, T. G., æt. 43, employed in attending to the fires, &c. in the building, including the small-pox wards. No. 17, M. A. J., æt. 45, employed as laundress at the hospital. No. 37, E. P., æt. 25, who had been for a short time employed as a nurse in the hospital, having previously been in the laundry (quarantine cases). No. 66, M. V., æt. 20, a wardmaid. No. 106, E. W., æt. 40, a nurse in the small-pox wards 200, A. S., æt. 23, a wardmaid.

Of these, Nos. 13, 17, 66, and 200 had been vaccinated in infancy, but not re-vaccinated; No. 106 said that she had been re-vaccinated 10 years before; and No. 37 was re-vaccinated on the day that she showed premonitory symptoms.

No. 13 had a severe confluent attack his illness lasting seven weeks.

No. 17 was known to be of intemperate habits, and died on the 13th day of her illness.

The attacks in the cases of Nos. 37, 106, and 200 were extremely mild and characterised by very sparse symptoms, whilst No. 66 had a discrete attack

The staff at the fever hospital at the end of 1892 consisted of 28 persons, viz., one medical superintendent, 1 matron, 15 nurses, 1 cook, 3 wardmaids, 4 laundresses, 1 stoker, 1 porter and his wife. Of these 22 had either been re-vaccinated (including 8 re-vaccinated at the time of the outbreak) or had formerly had small-pox, and the only one who did not fall into these categories and who escaped attack was the matron, who visited the wards occasionally but took no part in the actual nursing of the cases. (*See* Dr. Priestley's Report.) "During the epidemic 1892–3, there have been 12 additions to the small-pox staff, consisting of 5 nurses "3 laundresses, 1 wardmaid, 1 stoker, 1 assistant porter, "and 1 quarantine assistant. They were all re-vaccinated." (*Loc. cit.* p. 120.)

Addendum to History of Outbreak.

In view of the interest and importance of the question of the aërial dissemination of small-pox from hospitals, I have reproduced here from the columns of the "Lancet," (August 6, 1894), the text of a paper read at the Congress of the British Institute of Public Health by Dr. Priestley, which deals exhaustively with the Newfoundpool cases that were so disproportionately numerous to those in the rest of the borough.

The Aërial Diffusion of Small-pox.

Dr. Priestley said: "The subject for discussion to-day is an important one, and I am tempted to give you my own experience somewhat in detail: firstly, because I was at one time *against* the aërial theory of the spread of small-pox from hospitals; and, secondly, because the Leicester experience is practically unique. Whilst admitting all the arguments that may be brought against the aërial theory, I am bound to confess that some, at least, of the facts that I have met with during the Leicester epidemic are only explainable on such a theory. You may, however, judge for yourselves from the following facts. About the middle of June, 1893, the cases of small-pox notified as occurring in Newfoundpool district became numerous, and it has been impossible to explain many of them except by assuming that they became infected from the hospital. The exact manner in which this is brought about is, I confess, a somewhat difficult question to decide, though it would seem to be either (*a*) *directly* through contact between patients and people outside the hospital, and by infection carried out by visitors, members of the staff, &c.; or (*b*) *indirectly* through the air, which may be (1) the atmosphere or (2) sewer gas—*i.e.*, through the drains. Probably both means of infection play important parts. What is found in Leicester is that the comparatively greatest number of cases is to be met with at Newfoundpool, a community consisting of about 3,000 people living in 600 houses. The position of the houses in regard to the hospital is south or south-west, whilst the distance of the nearest houses from the hospital is 620 feet and that of the furthest 1,750 feet. In this way a circle of 2,000 feet radius, with the hospital as a centre, would take in all the houses. Newfoundpool being, as it were, an isolated suburb, we can easily treat of it separately, though by reference to a map of Leicester it will be seen that with a circle of double the above radius many cases of small-pox that have occurred in the north end would also be included.

"Taking the cases from the commencement of our epidemic and analysing them, we find that—

In December, 1892, there sickened			3 cases	Beatrice Road - - 2 Pool Road - - 1
In January, 1893,	„	„	5 „	Beatrice Road - 2 Pool Road - - 3
In February, 1893,	„	„	0 „	
In March, 1893,	„	„	1 „	Ruby Street - - 1
In April, 1893,	„	„	1 „	Ruby Street - - 1
In May, 1893,	„	„	3 „	Ruby Street - - 1 Hawthorne Street - 1 Beatrice Road - 1
In June, 1893,	„	„	16 „	Rowan Street - - 2 Beatrice Road - 9 Ruby Street - - 2 Ivanhoe Street - 3
In July, 1893,	„	„	10 „	Beatrice Road - 3 Ruby Street - - 2 Ivanhoe Street - 1 Sylvan Street - - 2 Newport Street - 1 Fosse Road - - 1
In August, 1893.	„	„	6 „	Oban Street - - 1 Ruby Street - - 2 Newport Street - 2 Beatrice Road - - 1
In September, 1893,	„	„	1 „	Newport Street - 1
In October, 1893,	„	„	0 „	
In November, 1893,	„	„	4 „	Beatrice Road - 3 Ruby Street - - 1
In December, 1893,	„	„	5 „	Beatrice Road - 2 Ruby Street - - 3

"There have thus been 55 cases of small-pox in Newfoundpool, representing 38 infected houses, of which 16 were in Beatrice Road (23 cases), eight were in Ruby Street (13 cases), four were in Ivanhoe Street (four cases), two were in Newport Street (4 cases), two were in Rowan Street (two cases), two were in Sylvan Street (two cases), one was in Hawthorne Street (one case), one was in Oban Street (one case), one was in Pool Road (four cases), and one was in Fosse Road (one case).

"Further, of the 16 infected houses in Beatrice Road 11 were on the side nearest to the hospital (the back doors of the houses facing it), whilst Ruby Street, Ivanhoe Street, Newport Street, Rowan Street, Sylvan Street, Hawthorne Street, Oban Street, and Fosse Road all run at right angles to Beatrice Road—Rowan, Hawthorne, Ruby, and Ivanhoe Streets being nearest to the hospital at the respective distances, measuring to the middle of the streets, of 1,060, 1,077, 1,100, and 1,150 ft.

"Out of a total of 347 cases of small-pox 55 have occurred at Newfoundpool, giving a case-incidence there of 18·3 per 1,000 of the population as compared with 1·6 per 1,000 for the rest of the borough—that is to say, the Newfoundpool

Explanation of Chart II:—

This Chart has been prepared to illustrate, so far as the dates permitted, the connexion between persons attacked by small-pox during the progress of the epidemic. The colours indicate the condition of the patients as to vaccination.

people have suffered 11 times as much as the rest of the town. It is only fair, however, to examine these 55 cases more minutely to find out, *e.g.*, how many have arisen from previous cases and how many there are for which we fail to discover any definite source save that of probable infection from the hospital. As the result of my examination I find that out of the 55 cases 20 may be attributed to previous ones—*i.e.*, may be regarded as quarantine cases. Deducting these 20 cases, we still have 35 cases (representing 34 infected houses) whose sources of contagion are difficult to explain, save on this theory of hospital infection. Treating now the rest of the cases in the town in the same way—*i.e.*, deducting all those that have arisen from previous cases (as traced out by me) and comparing them with the Newfoundpool ones—we find that the ratio is as 1 to 20.

"So, too, by working out the number of *houses* infected in Newfoundpool and the rest of the borough, we find the ratio as 1 to 15.

"Thus, however we examine the subject—whether from the point of view of all cases, corrected cases, or infected houses—we find that Newfoundpool district has suffered 11 to 20 times as severely as the rest of the town, and in my opinion this state of things has been brought about by the close proximity of the Small-pox Hospital. The death-rate of the Newfoundpool cases is 7·2 per cent., as compared with 5·8 per cent for the rest of the borough.

"Taking the June cases (16 in number), we find that they sickened between the dates June 8th and 30th, and, dating back from 12 to 14 days for the incubation period of small-pox, we may assume a period of acute infectivity in Newfoundpool district between May 25th and June 18th. If, now, we analyse the weekly hospital returns we find that during the same period (May 25th to June 18th) the average weekly number of small-pox cases in the wards was 46. Treating the July cases (ten in number) in the same way, we find a period of acute infectivity in Newfoundpool extending from June 20th to July 15th, during which period the weekly average of hospital small-pox cases was 34. Combining these two periods of acute infectivity, it would appear that the hospital practically caused its greatest infection in the month of June, during which the weekly average of small-pox cases in the hospital was 49—a larger average than in any month during the year, except February, when the weekly average was 54. Why small-pox did not spread into Newfoundpool during February is a question which naturally suggests itself, and to endeavour to answer which I will now proceed. As mentioned previously, there are various ways in which a small-pox hospital may act as a centre of infection. 1. It is acknowledged that infection may spread directly from person to person; so that it is readily understood how contact between patients, officials, visitors, &c. in the hospital and persons outside may spread the disease. Personally I have been unable, however, to trace such contact, and the stringent rules that have been enforced during our epidemic have, moreover, practically rendered such a means impossible. Even assuming such contact to have taken place, it is strange that it should have happened in June and not in February. 2. Air-borne infection does seem to play a part in small-pox epidemics if we may judge from various reports, not only those specially published by the Local Government Board but also those that have lately appeared in connexion with recent small-pox outbreaks in various large towns. The air-borne infection may be (*a*) above ground — *i.e.*, through the atmosphere—or (*b*) underground—*i.e.*, through the drains; and in either case it is reasonable to suppose that, taking a hospital as a centre, the cases would crop up more thickly the nearer the houses were to that hospital. Such is the case with the infected houses in Newfoundpool. In considering this air-borne infection there are many matters deserving our attention. Foremost are the accompanying meteorological conditions — *e.g.*, rainfall, temperature, direction of winds, &c.—and in considering these conditions I have been struck with the great difference as between February and June (see Table). In February the rainfall was 2·12 inches; the mean temperature low, varying from 45° to 31° F.; whilst the direction of the winds was principally west and south—*i.e.*, away from Newfoundpool and the state of the weather was blue sky on nine occasions and cloudy on 14, whereas in June the rainfall was 0·64 inches, the mean temperature high, varying from 70° to 45°, whilst the direction of the winds was principally north and east—*i.e.*, right over Newfoundpool from the hospital and the state of the weather was blue sky on 19 occasions and cloudy on nine. Meteorological conditions, therefore, would certainly favour the spread of germs from the hospital towards Newfoundpool during June, but not in February. The barometric pressure was low in February, high in June. 3. Another means by which germs might be carried is by flies, rats, &c., and, though at first blush this may seem a far-fetched theory, when examined more carefully it is not so. Some recent experiments made by Sawtschenko show that cholera bacilli can live in the alimentary tract of a fly and be found alone in the excreta. He fed flies on the intestinal contents of cholera cases and found the characteristic bacilli in their alimentary canals and their excretions afterwards. Considering the number of flies and rats we have had at the hospital (the flies we might speak of as a plague, in such quantities were they), it is easily understood how they might carry infection about, more especially during the warmth of June than during the cold of February.

"Everything, therefore, seems to favour the theory that our small-pox hospital has, during part at least of our epidemic, been a centre of infection; but the exact mode in which that infection has spread it is somewhat difficult definitely to decide, though personally I am satisfied that the air has played an important part. Germs might also pass through the drains and be drawn by the ascensional force of evaporation through sewer gas into the houses. It is, I believe, thought by some that Newfoundpool district is unsanitary, allowing of the escape of sewer gas into and around the houses there. I accordingly had all the houses infected by small-pox examined by the smoke test, with the result that of 38, only eight showed any sanitary defects, and those but slight ones. Further, it is a remarkable fact that during our epidemic of typhoid fever (1893)* no case directly arose in Newfoundpool, and yet typhoid fever is acknowleged to be an index of the sanitary, or rather insanitary, state of a house or district.† I also had the whole of the houses on the north side of Beatrice Road—*i.e.*, all those houses whose backs face the small-pox hospital and are separated therefrom by 622 ft.—examined by the smoke test, with the result that out of a total of 54 houses, 41 gave no results and 13 showed slight defects—viz., escapes of sewer gas into external closets, through rain-water pipes connected direct with drains, or from round about defective gullies (sinks). Of these 13 houses four only had been infected by small-pox, whereas of the 41 that gave no results five were actually houses which had been infected by small-pox. Thus:—

54 houses	invaded by small-pox	9	4 showing sanitary defects.	
			5 showing no sanitary defects.*	
	not invaded by small-pox	45	9 showing sanitary defects.	
			36 showing no sanitary defects.‡	

Rain-water pipes were only found directly connected with the sewer at Nos. ——, ——, and ——, Beatrice Road (the first only being a house infected by small-pox). There are no storm-water sewers in Newfoundpool, I am told. The only conclusion (if any) to be drawn from the above facts is that an insanitary state of the house drainage does not *per se* give rise to small-pox, even when near to a small-pox hospital. The Sanitary Committee, fully alive to the danger of a small-pox hospital being near to other buildings, have endeavoured during the year to find a suitable site away from the town, but as yet unsuccessfully."

§ 10.—Record of the Proceedings of the Town Council, Sanitary Committee, and Fever Hospital Sub-Committee, relating to the Small-pox Epidemic.

By the courtesy of the Town Council I am enabled to append here the text of the recommendations made by the Sanitary and Hospital Committees and of the resolutions bearing thereon which were passed at the meetings of the Council. They give in succinct form the history of the steps that were taken to deal with the epidemic.

It may be convenient if I here briefly summarise the chief points which arise out of these extracts, and thus to present in a connected form an outline of the history of the sanitary administration of the borough during this outbreak, so far as the information here furnished permits. It will be seen that quite early in the outbreak the Sanitary Committee received detailed reports of its progress from the Medical Officer of Health, giving particulars of the several cases and of the measures taken. Apparently the accommodation for quarantining families at the hospital soon proved to be insufficient, for we find that the Fever Hospital Committee on October 31st, 1892, passed a resolution to the effect that the "present arrangements for watching "persons at their own homes will be sufficient." But the "quarantine" block at the hospital was then occupied by children convalescing from scarlet fever, and on November 1st, it was resolved to invite parents, if they so desired, to

* One house in Oban Street became infected by typhoid fever from an outside source.

† It is only right to state that, previously to the decline in the number of Newfoundpool cases, several sewer ventilators in the streets there were by order closed and shafts run up some of the houses. This may have had a beneficial effect.

‡ That is, so far as the smoke test showed.

remove their children therefrom. At the same time steps were taken to provide an iron building, the erection of which was sanctioned by the Sanitary Committee, who at the same time (November 2nd, 1892) arranged for the daily visiting by the inspectors "of the 40 convalescent "cases who had left the hospital to-day," and the Medical Officer was authorised to vaccinate any of these children if so desired by their parents.

On November 9th, 1892, the Town Council received a report from the Sanitary Committee recommending the erection of a new hospital for infectious diseases on the site of the existing one, at an estimate expenditure of 55,000*l.*, the sanction of the Local Government Board being sought to raise a loan for that amount. The Town Council considered this report on November 15th, the amount of the loan being fixed at 20,000*l.* as a first instalment; but the proposal was rejected, there being an equality of votes for and against it, and the Mayor declaring it to be lost.

On December 14th, 1892, the Fever Hospital Committee resolved to institute an inquiry into the outbreak of small-pox at the hospital, and a special sub-committee for this purpose was appointed, with Ald. Clifton in the chair. This sub-committee met several times, and exhaustively investigated the earlier history of the outbreak, and in particular into the cases arising amongst the poor patients at the hospital. The inquiry extended from December 21st to March 2nd, 1893, when the sub-committee issued a report together with verbatim minutes of the evidence. That report was received by the Sanitary Committee on March 24th.

On December 16th, 1892, the Sanitary Committee decided to have plans prepared for three small buildings in lieu of the existing small-pox wards; and on December 21st, the Fever Hospital Committee recommended that the scarlet fever wards be utilised for small-pox.

On January 13th, 1893, the Sanitary Committee considered a report from the Medical Officer pointing out the importance of isolation of those who had been exposed to infection from small-pox cases, and suggesting an increase in the hospital accommodation, an improvement in the quarantine building, and urging the thorough disinfection of houses invaded by the disease. The committee decided to carry out the suggestion of improving the quarantine accommodation, and appointed a sub-committee to consider the question of erecting new temporary quarantine buildings. This matter was dealt with at the meeting of the Town Council on the same day, when it was agreed to provide additional accommodation for quarantine on the eastern side of the existing hospital at an estimated cost of 1,800*l.* Steps were taken on the 14th and 20th by the Fever Hospital Committee to carry out this resolution, pending the completion of which the chairman was authorised to arrange for the use of one of the houses belonging to the Corporation at Newaster, for temporary quarantine purposes, if found desirable. On February 28th, the Town Council received a report from the Sanitary Committee upon the tenders for the auxiliary building to be erected on the eastern side of the existing Infectious Diseases Hospital, and resolved to apply to the Local Government Board for sanction of a loan in connexion with these new buildings. A motion to defray the cost out of revenue, should the Local Government refuse its sanction, was put and lost.

Meanwhile the system of removing persons exposed to infection to 14 days' quarantine at the hospital was only being partially carried out. In many instances the alternative plan of daily supervision of such persons at their own homes was instituted; so that the need for extending quarantine accommodation was being less urgently pressed. It was indeed finally settled, on the adoption, on April 7th, by the Sanitary Committee of the joint report of the Fever Hospital and Zymotic Diseases Sub-committees, which was appointed on December 15th, 1892, to inquire into the outbreak of small-pox. The recommendations bearing on this matter given in this report was that "on a case of small-pox occurring, the "patient should be at once removed to the hospital, and "the other occupants of the house taken to a building "apart from the small-pox hospital, and given a dis-"infecting bath and their clothes disinfected. In the "meantime, the dwelling-house, and all therein should "be throughly disinfected, and afterwards they should be "allowed to return to their houses, but visited daily for 14 "days by a Sanitary Inspector, who should report to the "Medical Officer immediately any sickness occurred. . . ." "We are also of opinion that all persons who are frequently "brought into contact with small-pox patients should "adopt all protective measures known to science." It was further resolved, on April 14th, to print and circulate the report which had been drawn up by a minority of that special sub-committee, which did not, however, make any recommendations, but urged that the limitation of the outbreak had "confirmed the value of what is known as the "Leicester method of dealing with variolous outbreaks."

From a report made by the Medical Officer to the Fever Hospital, on May 10th, the steps then taken and referred to as consisting in (1) removal of patient to hospital and disinfection of rooms; (2) placing of inmates of infected house "under quarantine observation at their own homes" for 16 days; (3) notification of any illness among the "quarantined;" (4) the quarantined ought not to go to work during whole or part of their quarantine—compensation being allowed in each case, no more than to cover rent and maintenance, or if quarantined at hospital, only such as covered rent, and replacement of fresh clothes, bedding, or to replace those destroyed; (5) "Persons "whilst under quarantine observation are allowed to go "about and are encouraged to take walks into the country, "but are advised not to enter anybody's house, any public "institution, or meeting, under penalty of forfeiting their "monetary allowance." The Medical Officer also stated that he was led to prefer to watch the people at their own homes to sending them into quarantine even from the opinions held by some that quarantine wards within the same curtilage as small-pox wards may be a source of danger to their inmates. (For his other statements see letter.) On May 12th the Sanitary Committee resolved that "the course of procedure in reference to quarantine in con-"nexion with small-pox now being pursued as reported by "the Medical Officer to the sub-committee be continued "for the present."

I may here remark that this procedure virtually abandoned the method of removal of infected persons to quarantine, and substituted for it a system of supervision termed "quarantine at their own homes" in all cases, in which however a considerable amount of liberty was given to the people in their movements, and in certain cases permission granted them to continue at their employment. It is clear that this plan, which, it may be added, seems to have succeeded as well as the other, cannot be considered as equivalent to strict quarantine.

On May 30th and June 5th the Town Council had before them the report of the sub-committee on the outbreak, and the resolution of the Sanitary Committee thereon. An amendment to adopt the minority report was lost, and another amendment to the effect "that the Council "recognises the difficulties experienced by the Sanitary "Committee in dealing with the recent small-pox outbreak "in the borough and approves the arrangements now in "force for checking the further spread of the disease" was carried and adopted as a substantive motion.

On June 14th the Fever Hospital Committee had under consideration the reply of the Local Government Board declining to sanction a loan for the proposed new small-pox buildings in the vicinity of the present hospital, and resolved to again approach the Board on the subject.

On June 23rd the Sanitary Committee depute their chairman to make a statement to the Council "showing the "difficulties in which the Committee are placed in dealing "with the outbreak of small-pox."

On June 30th the Sanitary Committee decided to advertise for land for a site for a proposed new Infectious Diseases Hospital, and on July 31st the Fever Hospital Committee received offers of sites and inspected some of them. At the same meeting it is decided to re-open the fever wards;* but on September 26th the Sanitary Committee reported to the Council that "in consequence of the "continuance of small-pox your Committee regret that "they have been prevented for several months past from "authorising the reception of fever cases at the hospital." and mentioned their endeavours to procure another site for a temporary small-pox hospital. Such a site seems ultimately to have been selected by conference with the Sewage Farm Committee, but it was not utilised. At any rate a building was erected on the site of the present hospital, which received small-pox cases in January 1894.

I.

Proceedings and Resolutions of the Town Council.

November 9th, 1892.

Report presented to the Council by the Sanitary Committee on Wednesday, the 9th day of November 1892.

Proposed new hospital.

Your Committee have to report that they have further considered as to the steps to be taken for the

* These wards were prepared for the reception of cases, but not re-opened at the close of the year.

erection of a new hospital for the treatment of contagious and infectious diseases, and they recommend that the plans prepared by Mr. Edward Burgess, for which the first premium was awarded, be adopted, subject to any modifications which it may hereafter be found desirable or necessary to make. The new hospital, which it is proposed to erect on the site of the existing hospital at Freake's Ground, will comprise the following buildings, namely:—

Five blocks of scarlet fever wards, each block to accommodate 26 patients.
One block of typhoid wards, to accommodate 26 patients.
One block of small-pox wards, to accommodate 26 patients.
One block of quarantine wards.
Administration block.
Lodge, laundry, stables, mortuary, and other out offices.

Mr. Burgess states that "the architectural "character of the buildings has been kept as simple "as possible, and all superfluous ornament has "been avoided. The work is, however, estimated "as being very substantial and thoroughly well "built." The buildings generally will be faced with red pressed bricks, with as little stone as possible, and the roofs covered with Welsh slates.

The total estimated cost of the buildings is 45,834*l.*, but this is exclusive of furnishing, fitting, and other probable outlay. Your Committee are of opinion that the total capital expenditure in carrying out the scheme will amount to not less than 55,000*l.*, and they recommend that an application be made to the Local Government Board for their sanction to borrow that sum.

Your Committee, however, do not propose that all the buildings should be erected at once, but advise the Council to proceed with the scheme in sections, as it may be thought desirable, during a series of years. By adopting this course it will be unnecessary to remove more than a small portion of the existing hospital buildings at one time in order to make room for the new blocks, and thus a considerable amount of accommodation for the treatment of patients will be available during the progress of the new buildings. Your Committee recommend that the services of Mr. Edward Burgess be retained as architect to carry out the first block of buildings, leaving the question of the architectural superintendence of other blocks for the consideration of the Committee, and determination of the Council from time to time as it is decided to proceed with the work.

Your Committee recommend that authority be given to affix the common seal to a memorial to the Local Government Board to sanction the borrowing of the sum of 55,000*l.*

THOMAS WINDLEY,
Chairman.

Resolved:

That the Report of the Sanitary Committee be considered at a special meeting of the Council on Tuesday next at 5 o'clock.

Resolved:

That the Sanitary Committee be authorised to incur such expense as they may think necessary in any temporary accommodation at the Fever Hospital for the purpose of isolation and treatment of cases of small-pox.

15*th November* 1892.

The Town Clerk presents the report of the Sanitary Committee which was submitted to and received by the Council at the last meeting.

Moved, &c.:

That the report be approved and adopted.

By consent of the Council the original motion is amended as follows:—

"That the scheme for a new hospital as submitted by the Sanitary Committee be approved and placed before the Local Government Board with an application for a loan of 20,000*l.* as a first instalment."

For the motion of Alderman Windley as amended	- 24 votes
Against	- 24 „

The Mayor declares the motion not carried.

13*th January* 1893.

The following report was presented from the Sanitary Committee:—

Infectious Diseases Hospital.

"Your Committee have further to report that the number of cases of small-pox in the borough has increased considerably. All the known cases, numbering on Friday last 60, are in the Borough Infectious Diseases Hospital, and a large number of persons who have been in contact with these cases are isolated in the quarantine wards of the hospital, or at their own homes under observation of officers of the department. Your Committee are sensible of the great responsibility resting upon them, and they have every hope that, by energy and vigilance on the part of their officers, and with the co-operation of the Council and the public, the disease may be prevented from spreading to any considerable extent. If, however, the disease should assume more serious epidemic form, it will be necessary to be prepared with more hospital accommodation for the treatment of patients as well as for the isolation of persons who have been in contact with infection; in fact, the resources at the hospital for this latter purpose are now utilised to the utmost. Your Committee have therefore had under their consideration the question of providing more adequate accommodation, and they recommend that a building should be at once erected on the piece of ground on the eastern side of the existing hospital buildings, which may be available at an early date for temporary quarantine purposes. The building proposed is based on a plan published by the Local Government Board, and the estimated cost is about 1,800*l.* Your Committee request authority for this building to be erected with the utmost despatch. Your Committee have called to their assistance Mr. W. M. Cowdell, architect, to prepare the necessary plans and superintend the erection of the building.

THOMAS WINDLEY,
Chairman."

Resolved:

That so much of the report as relates to the provision of additional accommodation at the Infectious Diseases Hospital at an estimated cost of 1,800*l.* be approved and adopted.

28*th February* 1893.

Report by the Sanitary Committee.

"Infectious Diseases Hospital.

"The Sanitary Committee beg to report that they have obtained tenders for the erection of the auxiliary building which the Council, at their meeting on the 31st January, authorised to be erected on the piece of ground at the eastern side of the existing Infectious Diseases Hospital, and they have accepted the tender of Mr. J. E. Johnson, of Leicester, at 1,762*l.*, and request authority for the common seal to be affixed to the contract of Mr. Johnson and his sureties."

Moved, &c.:

That so much of the report as relates to the acceptance of the tender of Mr. J. E. Johnson for the erection of buildings in connection with the Infectious Diseases Hospital at the sum of 1,762*l.* be approved and that the common seal of the borough be affixed to the contract with Mr. Johnson and his sureties.

Amendment:

That an application be made to the Local Government Board for a loan of 2,500*l.* for the erection of the proposed new buildings at the Freakes Ground; and that a memorial to the Local Government Board be sealed with the common seal of the borough.

For amendment	- 24 votes
Against	- 17 „

The Mayor declares the amendment carried, and it is then put as a substantive motion and carried.

Moved, &c.:

That the building at the Freakes Ground be proceeded with, and that, failing a loan being obtained, the cost be defrayed out of revenue.

For motion	- 13 votes.
Against	- 26 „

The Mayor declares the motion lost.

30*th May* 1893.

The Town Clerk submits the reports of the Medical Officer of Health on the small-pox outbreak, the minutes of proceedings of the Fever Hospital Sub-committee of the Sanitary Committee on their investigation of the outbreak of small-pox and report adopted by the Committee on the result of the investigation, copies of which have been furnished to each member of the Council.

Resolved:

That the reports be received and taken as read.

Moved, &c.:

That the report of the Sanitary Committee be approved.

Amendment:

That in the opinion of this Council the proposed report, which was voted for by a minority of the Sanitary Committee, and by direction of that Committee, printed and a copy sent to each member of the Council, contains deductions and conclusions reasonably to be drawn from the reported proceedings of the small-pox investigation, and that it be approved by this Council.

At about 9.30 it is—

Resolved:

That the discussion be now adjourned.

Resolved:

That the adjourned meeting be held on Monday next at 5 o'clock.

5*th June* 1893.

The Council further consider the motion for the approval of the Sanitary Committee's Report which was at the last meeting of the Council moved by Ald. Clifton and seconded by Ald. Eise, and the amendment thereto, which was moved by Mr. Biggs and seconded by Mr. Orton.

For Mr. Biggs' amendment - 19 votes.
Against - - - 25 ,,

Two members do not vote—15 members are absent when the vote is taken, and there are three vacancies.

By request the votes are recorded by the Town Clerk.

The Mayor declares the amendment lost.

Amendment:

That the Council recognises the difficulties experienced by the Sanitary Committee in dealing with the recent outbreak of small-pox in the borough, and approves the arrangements now in force for checking the further spread of the disease.

For amendment - - 36 votes.
Against - - - 1 vote.

The Mayor declares the amendment carried, and it is then put as a substantive motion and carried.

26*th September* 1893.

Resolved:

That the Council at its rising do adjourn until Wednesday, the 4th Octoher, at 5 o'clock, for the further consideration of the report of the Sanitary Committee so far as it has not already been disposed of by the Council.

From the report of the Sanitary Committee:—

"Site for Small-pox Wards.

"Your Committee have also to report that for some time they have been endeavouring to procure a piece of land to be used as a site for temporary buildings for the reception of cases of small-pox, with a view to the buildings at Freake's Ground being again rendered available for the treatment of scarlet fever cases. In consequence of the continuance of small-pox, your Committee regret that they have been prevented for several months past from authorising the reception of fever cases at the hospital. Your Committee are glad to be able to report that they have now, subject to the approval of the Council, arranged to purchase a piece of land, containing about 4¼ acres, situate in the Aylestone Lane in the parish of Wigston, and which the Committee are of opinion is very suitable for the purpose above mentioned. The vendor of the land is Mr. John Tebbs, of Glenfield, and the price agreed to be paid is 150*l.* an acre. Your Committee recommend the arrangement for the approval of the Council, and request authority to complete the same without delay."

4*th October* 1893.

Resolved:

That the Sanitary Committee be requested to confer with the Sewage Farm Committee and to report to this Council as to the practicability of providing suitable temporary small-pox hospital accommodation on some portion of the Beaumont Leys Estate.

2*nd January* 1894.

Resolved:

That so much of the report as relates to orders to carry out works and abate nuisances; to the public analyst; the inspector of food; persons treated at the fever hospital; erection of temporary buildings and certificates of contagious and infectious diseases be approved and adopted.

Resolutions of Sanitary Committee.

30*th September* 1892.

Resolved:

That the Medical Officer forward a copy of his report on the outbreak of small-pox now read to the Local Government Board.

21*st October* 1892.

The Medical Officer of Health submits a report on the discovery of further cases of small-pox.

Resolved:

That all special reports of the Medical Officer of Health to this Committee on small-pox be printed and sent to members of the Committee for their private use and simultaneously to the Local Government Board.

2*nd November* 1892.

Resolved:

That the borough surveyor be directed to proceed at once with the foundations for the Humphrey's Building; also that a covered way be provided from the new building to the ward, and that the requisite fencing be fixed.

Resolved:

That the chief inspector and one assistant be deputed to visit daily the 40 convalescent cases which the Medical Officer reports to have left the hospital to day and report to the Medical Officer of Health each day.

Resolved:

That the Medical Officer be provided temporarily during the small-pox outbreak with a horse and carriage.

Resolved:

That the Medical Officer of Health be authorised to vaccinate any of the convalescent patients discharged from the hospital to-day if desired by their parents to do so.

4*th November* 1892.

Resolved:

That the Medical Officer of Health be authorised to furnish the information respecting the cases of small-pox in accordance with the request contained in the letter from the Secretary of the Royal Commission on Vaccination which is now submitted.

11*th November* 1892.

The town clerk reports the receipt of a communication from the Secretary of the Vaccination Commission stating that the Commission have appointed Dr. Sidney Coupland to attend at Leicester to make an investigation in reference to the outbreak of small-pox and requesting that the Corporation and their officers will give all facilities for the inquiry.

Dr. Coupland attends before the Committee and states the nature of his commission.

It is understood that the chairman will to-morrow meet Dr. Coupland in order to render him assistance in connection with the inquiry.

25*th November* 1892.

Resolved:

That under the exceptional circumstances of the case 30*s.* be allowed to Mr. Hackett who with his family has been in quarantine at the Fever Hospital and has sustained some loss thereby.

Resolved:

That 10*s.* a week be paid to Mrs. Brett for extra duties at the hospital during the small-pox epidemic.

16*th December* 1892.

Resolved:

That under the exceptional circumstances of the case 30*s.* each be allowed to Mr. Jones and Mr. Rowen, who with their families have been in quarantine, and have sustained loss thereby.

Resolved:

That under the exceptional circumstances of the case 30*s.* each be allowed to Mr. Dewick, who with his family has been in quarantine, and has sustained loss thereby.

Resolved:

That Mrs. Folwell's application to be allowed to visit her child at the Fever Hospital, who is reported to be dying of small-pox, be granted.

Resolved:

That the borough surveyor he instructed to prepare a plan for three small buildings in substitution for the present small-pox wards and that a sub-committee consisting of the chairman, vice-chairman Mr. Biggs, and Mr. Meadows be appointed to consult with the borough surveyor on the subject.

23*rd December* 1892.

Resolved:

That in consequence of the exceptional circumstances of the case 30*s.* be allowed to Mr. Lee, who with his family have been in quarantine, and has sustained some loss.

Resolved:

That 50*s.* be paid towards the cost of the funeral of the child Folwell, who has died at the Fever Hospital from small-pox.

Resolved:

That clothing be provided for the man George Moore, who has been in the hospital.

6*th January* 1893.

Resolved:

That the borough surveyor be instructed to obtain an estimate for a Manchester stove to be placed in the small-pox ward at the Fever Hospital.

Moved, &c.:

That under the special circumstances of the case, 12*s.* be paid towards the rent of Mr. Smith, who has been with his family in quarantine at the hospital.

Amendment:

That it be left in the hands of the accounts sub-committee to determine under the special circumstances of the cases of persons in quarantine, or under isolation, if any, and what allowances shall be made to such persons.

The Amendment is carried.

13*th January* 1893.

The Medical Officer of Health reads his report submitted to the Fever Hospital Sub-committee on Wednesday last as follows:—

Town Hall, Leicester,
13th January 1893.

GENTLEMEN,

WITHOUT wishing to alarm you as a sanitary committee, I feel it my duty to bring one or two matters which are of vital importance before your notice, and to ask your immediate consideration thereon.

You have now in Leicester, many different centres in which small-pox has broken out, and from which the disease may spread, so that it behoves you without further delay to make such preparations as may be necessary. I venture to remind you that Leicester is practically an unvaccinated town, and accordingly your sheet anchor in preventing the spread of small-pox is isolation, isolation not only of the cases, but of the persons who have directly or indirectly come in contact with them. Such isolation to be effective must be prompt, and with the many centres of infection already in the town I need not say that your isolation accommodation will be sooner or later (I may say is now in some respects) taxed to its utmost. Unless you are prepared to immediately isolate all your first cases as they crop up, you will soon lose your control over the outbreak or epidemic (call it what you will), which is at present threatening your hospital accommodation, your quarantine accommodation must be elastic and capable of stretching considerably if it is to be of any use. Further, no cases of small-pox ought to be left in the town if possible.

As your officer of health I beg to offer the following suggestions:—

(1.) That a temporary provision be immediately made for an extension of your hospital accommodation by means of tents or otherwise. The necessity for so doing must be apparent when you consider that your present hospital has only room for 140 cases, and when you remember how important it is to avoid anything of the nature of overcrowding in the wards of a small-pox hospital Again there are already to-day in the wards of your fever hospital, 25 small-pox patients of whom 22 have been admitted during the last 12 days from 18 different centres. Admitting patients at this rate and remembering that the average stay in hospitals for small-pox is four to eight weeks, it is easy to calculate how long it will be before your present hospital will be full.

(2.) That some of the present quarantine wards be sub-divided off by means of wooden partitions into a series of compartments, which would serve as separate bedrooms whilst the first large room could be kept as a dining and recreation room, and might with advantage be supplied with a variety of things that would tend to make quarantine life bearable if not enjoyable. I refer to bagatelle, &c. I recommend also that an extra w.c. or two be provided, and that a caretaker be appointed to look after the quarantine and the quarantine only. Further, as more quarantine accommodation will be (I may say is) needed, it may be well for you to consider the advisability of at once taking some house or houses in the town, away from the fever hospital houses wherein to place and watch people who have come into contact with small-pox cases.

(3.) That disinfection be carried out more stringently. By this I mean that all houses in which small-pox breaks out should be first thoroughly fumigated as customary with sulphur; but, further, that the wall papers shall be stripped off, ceilings and walls to be white or lime washed; all paints and floors be washed thoroughly with soap and water or with some disinfectant solution in addition to the stoving of all clothes and bedding in the hospital disinfecting machine.

In conclusion, I would remark that I have purposely avoided all reference to the all important subject of vaccination and re-vaccination—not because I do not value them as a means of stamping out small-pox, but simply because I feel the importance under the present circumstances of strengthening as much as possible your Leicester system and because I am most anxious to avoid anything of the nature of a discussion, which, unfortunately, in Leicester might at present prove useless. I shall, however, have something to say on the subject of vaccination and re-vaccination afterwards.

Yours faithfully,
J. PRIESTLEY.

Moved by Mr. Richardson, seconded by Mr. Ellis and carried:

That the report be received.

Moved by Mr. Richardson, seconded by Mr. Leavesley, and carried:

That so much of the report as recommends the partitioning of the quarantine ward be adopted and the work carried out.

Moved by Ald. Clifton, seconded by Mr. Ellis, and carried:

That the question of erecting new temporary quarantine buildings on the land adjoining the Fever Hospital site or other land be considered by a sub-committee composed of the following gentlemen, namely:—Mr. Biggs, Mr. Booth, Mr. Brady, Ald. Clifton, Mr. Ellis, Ald. Wilford, and Ald. Windley, and reported upon at the next meeting of the Sanitary Committee.

Moved by Ald. Clifton, seconded by Mr. Ellis, and carried:

That the Medical Officer's recommendation as to disinfecting the infected houses in the town be carried out.

Moved by Mr. Biggs, seconded by Mr. Richardson, and carried:

That the Chairman, Vice-Chairman, and Medical Officer of Health be authorised to order and have erected in such position as they may think suitable any tents which they may find to be requisite.

Moved by Mr. Richardson, seconded by Mr. Brady, and carried:

That the recommendation of the Medical Officer, that a caretaker be engaged for the quarantine wards, be adopted.

The Medical Officer of Health expresses his objection to any quarantine buildings of a permanent character being erected in proximity to the hospital.

20th January 1893.

Resolved:

That 10*s.* be paid to Mrs. Folwell for the clothing of her child, which died in the hospital, the clothing having been destroyed.

The report of the Fever Hospital Sub-committee as entered in the sub-committee minute book on pages 392 and 393 is read.

Moved, &c.:

That the report be approved.

Amendment:

That the report be approved, except that the Medical Officer of Health be authorised to furnish information to the newspapers as to small-pox daily.

The amendment is not carried and the motion is put and carried.

Resolved:

That Mr. Cowdell be engaged as architect for the proposed block of hospital buildings, and that he be instructed by the borough surveyor.

Resolved:

That the chairman be authorised to arrange for the use of one of the Corporation houses in the Newarke for temporary quarantine purposes if found desirable.

27th January 1893.

Resolved:

That the resolution passed by the Committee at the last meeting approving the report of the Fever Hospital Sub-Committee be rescinded so far as relates to furnishing the information to the Press in reference to small-pox, and that the Medical Officer of Health be authorised to give daily information to the Press.

Resolved:

That the information to be given to the Press be the number of the cases which occur each day and the locality of the cases.

Resolved:

That notices be given under sections five and six of the Infectious Diseases Prevention Act, 1890, where necessary with the object of securing effectual disinfection of infected houses and articles.

10th February 1893.

Resolved:

That Mr. Jayes of 78, Norfolk Street, be prosecuted for neglecting to notify a case of small-pox.

3rd March 1893.

Resolved:

That a further 30*s.* be paid to Mr. Raven in consideration of his additional loss in consequence of his having to remain.

The Town Clerk reports the prosecution on Monday last of Henry Jayes of Norfolk Street for neglecting to notify to the Corporation a case of small-pox at his house, when he was fined 1*l.*, including costs.

10th March 1893.

Resolved:

That the Fever Hospital Sub-Committee meet on Wednesday next at 4 p.m. to consider the communication of the Local Government Board and as to the hospital expenses and that the meeting to consider as to the reports on the small-pox inquiry be deferred until the following week.

7th April 1893.

The report of the Fever Hospital and Zymotic Diseases Sub-Committee received by this Committee on the twenty-fourth March is again considered by the Committee, and it was—

Resolved:

That the report of the Sub-Committee be adopted by this Committee.

Further resolved:

That the report now adopted be presented by this Committee to the Council, and that a print be sent to each member of the Council, accompanied by prints of Dr. Priestley's Reports, and of the minutes of evidence and proceedings of the inquiry into the small-pox epidemic.

The Report of the Sub-Committee details the particulars of the first cases which occurred in the borough, and the history of the importation of small-pox into the fever wards so far as regards the case of E. K. (No. 7 in list), and makes the following recommendations:—

Your Committee are of opinion that the old quarantine wards, which are part of the main building of the scarlet fever blocks, should never be used for such purpose, being also in near proximity to the old small-pox ward; that if there is any quarantine carried out at the hospital, it should be in a building as far as possible from the other infections wards, with separate administration and laundry departments, and then only used in cases where householders can be placed whilst their homes are being thoroughly disinfected; and that all persons who have been known to have come in contact with small-pox cases should be visited as at present by the Sanitary Authority daily for 14 days. If any cases are at all doubtful, they should be then taken up to a part of the old erysipelas ward, which then might be used as a temporary observation ward.

We would also urge that if the old buildings are again used as a scarlet fever hospital, that there should be built in its near neighbourhood a block of buildings quite separate from the others, which could be used for watching doubtful cases of infectious diseases, and that the old small-pox ward, which is now worn out, should be destroyed.

The so-called quarantine system, as practised in Leicester during the present epidemic, has been as follows:—

First.—All persons who had been in contact with a person suffering from the disease were removed into the building, and presumably kept isolated there for 14 days. This is what is generally understood as the Leicester system. In practice it has been found that the persons so quarantined refused to keep within the building, but insisted on visiting homes in the neighbourhood, and associating with friends outside the hospital.

Secondly.—In other cases the person suffering from the disease was alone removed to the hospital, and the other residents of the house were requested to abstain from going about their ordinary business for 14 days, during which time they were daily visited by the sanitary inspectors. During this period compensation was awarded for loss of time, the weak point of this system being that although these people did not go to work, they moved about the town, and visited neighbbouring houses.

Thirdly.—On an outbreak of small-pox occurring in a common lodging-house, in which the sufferer had necessarily come into contact with a very large number of persons, no isolation was attempted, nor compensation given, but the persons were allowed to go about their daily vocation as usual, the system adopted to prevent the spread of small-pox being, that all of the sanitary inspectors visited the lodging-house daily, to see if anyone had fallen ill. If there was any case of sickness, the Sanitary Inspectors reported to the Medical Officer, who visited the case. In each of the above cases the houses were disinfected.

The system which we recommend has been alluded to in the former portion of our Report, viz.: that on a case of small-pox occurring, the patient should be at once removed to the hospital, and the other occupants of the house taken to a building apart from the Small-pox Hospital, and given a disinfecting bath, and their clothes disinfected. In the meantime, the dwelling-house and all therein should be thoroughly disinfected, and afterwards they should be allowed to return to their houses, but visited daily for 14 to 16 days by a Sanitary Inspector, who should report to the Medical Officer immediately any sickness occurred.

We recommend that stringent regulations be made as to all visitors to the Small-pox Hospital, and that no one should be allowed to examine a patient in the absence of the Medical Officer; further, that the Medical Officer take such precautions with regard to the nurses in charge of small-pox patients as he may think necessary, both before they leave the hospital for their necessary out-door exercise, or at other times.

We are also of opinion that all persons who are frequently brought into contact with small-pox patients should adopt all protective measures known to science.

14*th April* 1893.

It was resolved:

That the report on the small-pox inquiry, proposed at the last meeting and voted for by a minority of this Committee, be printed for the private use of the members of the Council, and a print sent to each member.

The report here alluded to also reviews the earlier history of the outbreak in the town, and in the hospital, and dwells upon the fact of the error in diagnosis whereby three children were known to have been infected, and to which, further, they attribute the spread of infection in the hospital. The following excerpts from this report sufficiently explain the views of those who adopted it upon the question of hospital accommodation:—

"Notwithstanding the allegation so frequently made, as to the unsuitability of the hospital for the treatment of more than one infectious disease, we would point out that when other outbreaks of small-pox have occurred during the past 20 years, the three wards of the main building were occupied by scarlet fever patients. The same conditions, therefore, existed as when this outbreak occurred, with this important exception, that previously the small-pox block which is new entirely detached, was then directly connected with the main corridor of the fever hospital, thus enhancing the risk of infection. It is true the fever wards were full of scarlet fever patients at the time this outbreak of small-pox took place, but it must be remembered that the whole of the small-pox block was available for small-pox cases, and was capable of accommodating 30 to 40 patients.

"From October 3rd to October 19th, there were only three patients in the small-pox wards. In the quarantine wards there were only five persons, all of one family, viz.:— Mrs. Kerrad and four children, two of the latter being removed into the fever hospital on the 11th and 12th of October, thus leaving only three in quarantine. It cannot therefore be maintained that either the small-pox or the quarantine parts of the hospital were overcrowded.

"The number of patients in the fever wards would not be of material importance, because, even if they had been occupied with only half the number, they would have been equally unavailable for small-pox patients. It has been alleged that the overcrowded state of the fever wards was the cause of the outbreak in them of small-pox. This cannot be maintained from the evidence, neither can it be affirmed that the risk of infection from small-pox would be very considerable, as there were only three patients in the hospital at the time.

"It is noticeable that whilst Ward No. 3 is most exposed to small-pox contagion, from being nearest to the small-pox block, the disease first broke out in No. 1 ward, which is at the greatest distance, and therefore least exposed to any contagion which might exist.

"Complaint has been made as to the absence of rooms for purposes of isolation at the hospital. Whilst we do not consider the hoepital all that can be desired, we would point out that when Evelyn Kerrad first sickened there were at least two rooms—one in the quarantine block and one in the erysipelas block—both of which were entirely unoccupied. There was also another room available on emergency for the purpose of observation or isolation. One of these rooms was ready for immediate use, and the other two could have been prepared in a short time."

This report concluded as follows:—

"The experience of the present attack of small-pox has confirmed the value of what is known as the 'Leicester method' of dealing with variolous outbreaks. Had it not been for the efforts made in this direction we should no doubt have suffered more severely. In the Sanitary Committee, suggestions have been made from time to time, where improvements may be effected in the 'system,' and these will be acted upon in future. Upon these and other matters of a similar kind we make no recommendations, having limited this report to the object and scope of the inquiry."

21*st April* 1893.

The Medical Officer of Health reports that a deputation having waited upon him from the Thurmaston Local Board to request him to admit into the hospital a case of small-pox from their district, under the special circumstances of the case he consented to admit the patient.

Resolved:

That the action of the Medical Officer be approved, but that in future no cases of small-pox be admitted from the outside districts without the special consent of the Committee or the Chairman.

12*th May*, 1893.

Resolved:

That the course of procedure in reference to quarantine in connexion with small-pox now being pursued as reported by the Medical Officer to the sub-committee be continued for the present.

19*th May* 1893.

Resolved:

That payments amounting to 4*l.* 9*s.* be made to persons who are in quarantine at their houses.

23*rd June* 1893.

The Medical Officer reports in reference to the latest cases of small-pox which have arisen.

Resolved:

That the Chairman be requested to make a statement in the Council at the next meeting showing the difficulties in which the committee are placed in dealing with the outbreaks of small-pox.

30*th June* 1893.

Resolved:

That offers of land be invited by advertisement to lease with option of purchase for the erection of a hospital for the treatment of infectious diseases; also that the Estate Committee be asked if they can make an offer of any land for the purpose.

1*st September* 1893.

Resolved:

That 8*s.* be allowed to Mr. Hardy and 15*s.* to Mr. Tyler.

20*th October* 1893.

Resolved:

That the Committee approve of the site offered by the Sewage Farm Committee, and recommend it to the Council for approval if the approval of the owner can be obtained.

19*th January* 1894.

Resolved:

That 1*l.* be allowed to Mrs. Richardson, of 48, Wand Street, whose daughters have been kept from work in consequence of a case of small-pox occurring at her house.

Other allowances have been made on the recommendation of the accounts sub-committee.

Resolutions passed by the Fever Hospital Sub-Committee, and approved by the Sanitary Committee.

31*st October* 1892.

Resolved:

That in the opinion of this sub-committee the present arrangements for watching persons at their own houses when the hospital is full will be sufficient to meet the case.

1*st November* 1892.

Resolved:

That the parents of the children in quarantine be advised to attend at the hospital so that they may be informed of the danger of small-pox in the hospital, and asked if they wish their children to be brought home to-morrow (Wednesday) or would prefer to leave them at the hospital for the present.

Resolved:

That one of Humphrey's iron buildings (72l) at an estimated cost of 170*l.* be purchased and ordered by telegraph to-day.

14*th December* 1892.

Resolved:

That the recent outbreak of small-pox in Leicester so far as it has proceeded be thoroughly investigated and reported upon by this sub-committee.

21*st December* 1892.

Resolved:

That the three scarlet fever wards be recommended to be utilised for the reception of small-pox patients.

Resolved:

That the sub-committee appointed at the last meeting of the Sanitary Committee be requested to consider and report to the Sanitary Committee what alterations and additions are required to enable the preceding resolution to be carried into effect.

14*th January* 1893.

The sub-committee visit a number of sites proposed for temporary quarantine buildings.

18*th January* 1893.

Resolved:

That the ordinary weekly return be regarded by this sub-committee as sufficient information to supply to newspapers respecting the present outbreak of small-pox.

22*nd March* 1893.

Resolved:

That the application of Mr. Pickering made through the Medical Officer of Health for the use of a ward at the hospital for making experiments in his mode of treatment of small-pox be not granted.

10*th May* 1893.

(*Report of Medical Officer.*)

The method that is now being carried out in Leicester in connexion with the treatment and prevention of small-pox outbreaks is as follows:—

1. The patient is removed at once to the borough fever hospital and the house (room or rooms), bedding, &c., disinfected.
2. The inmates of the infected house and others who may have come into contact with the small-pox case are placed under quarantine observation at their own homes being visited by the inspector daily for 16 days.
3. Any case of illness amongst these quarantined persons is at once notified to the medical officer, who visits the case and removes it to the hospital if necessary.
4. The inmates of infected houses and others who may have been in contact with the small-pox case if thought necessary, are strongly urged not to go to work for the whole or part of their quarantine period of 14–16 days, and during that time have been made such allowances as the sub-committee have thought fit, the sum advanced in each case being no more than sufficient to cover rent and maintenance. In the event of persons, however, being quarantined at the hospital as all their food is found for them, only such allowance has been made as would cover the rent, whilst in the event of clothes, bedding, &c., being destroyed fresh ones have been provided.
5. Persons whilst under quarantine observation are allowed to go about and are encouraged to take walks into the country, but are advised not to enter anybody's house, any public institution or meeting under penalty of forfeiting their monetary allowance
6. Quarantine wards within the same curtilage as small-pox wards may, in the opinion of some, be a source of danger to their inmates; this consideration, together with the largeness of the numbers to be dealt with has led me to watch the suspected people at their own homes.
7. Those inmates of infected houses who are willing are sent up to the hospital to have a disinfectant bath and to have their clothes stoved whilst their houses are fumigated wish sulphur meanwhile. Those persons who refuse to go up to the hospital have disinfectants given them and are asked to have a disinfectant bath at home.

Under conditions satisfactory to the Medical Officer of Health certain of the people from infected houses are allowed to continue at their work during the whole or part of their period of quarantine. In the case of a small-pox patient being a child recently attending school, the schoo manager is waited upon a list obtained of absentees who are then visited and the schoolroom if necessary fumigated. So, too, where the patient is at work in a factory or workshop, the names of the absentees from that factory or workshop are obtained and the absentees visited. The room or rooms in which the patient may have been at work, whilst in an infective stage, are, if thought necessary, fumigated.

14*th June* 1893.

The following letter from the Local Government Board is read:—

(Copy.)

Whitehall, S.W.,
29th May 1893.

Sir,

I am directed by the Local Government Board to advert to your letter of the 2nd instant with reference to the additional hospital accommodation proposed to be provided by the Town Council of Leicester.

The Board infer either that the reception of patients suffering from small-pox is contemplated in the new building which would be only 40 yards distant from the existing infectious diseases hospital or that the erection of the new building is concerned with the intended simultaneous reception in the hospital, of which this building will form a part, of cases of small-pox and cases of one or more other infectious diseases. Under these circumstances I am to point out that this is a course which in several instances during the prevalent epidemic of small-pox has been associated with the transmission of the disease to patients professedly under isolation for other infectious fevers. It has, moreover, been strongly condemned by the Royal Commission on Small-pox Hospitals, 1882. On page xxxii of the report made by that Commission the following paragraph appears: "It is evidently of paramount "importance that the areas of the small-pox wards as well "as their administration should be rigorously separated from "those of the fever hospitals, and further, that their "construction should be such as to reduce within the "smallest limits the chance of spreading infection."

If the Board were correct in their belief as to the object which the proposed building is intended to serve, I am to refer you to their letter of the 9th March and to say that they would not be prepared to sanction any loan in this case.

I am, Sir,
Your obedient Servant,
C. N. Dalton,
Assistant Secretary.

J. Storey, Esq.,
Town Clerk,
Leicester.

Resolved:

That the Town Clerk be requested to communicate with the Borough Members of Parliament asking them to speak with the President of the Local Government Board with a view to the holding of an inquiry in reference to the application made to the Board.

Resolved:

That it be left in the hands of the Chairman and the Medical Officer of Health to arrange for special accommodation for private patients suffering from small-pox if required and to fix a charge for their treatment.

31*st July* 1893.

Resolved:

That the small-pox cases now in the hospital be placed in the northern ward and that the vacated wards be made available for the reception of fever cases.

The sub-committee inspect the Hinckley Road site, the Beaumont Leys Farm site; some of the sub-committee visit the Leicester Frith site, and the Freake's Ground site; and the two sites on the Thurmaston Road are also visited.

Several other offers of land have been made as suitable sites for a new hospital.

11*th October* 1893.

Resolved:

That the sewage works and farms sub-committee be invited to meet the Sanitary Committee on Friday next at 4.30 to discuss the question of the proposed utilisation of land on Beaumont Leys as the site for a small-pox hospital.

§11. *Analytical Study of the Outbreak.*

The period embraced by this inquiry covers 70 weeks, reckoning from the week ending August 27th, 1892—the week in which arose the first case that came to the knowledge (subsequently) of the authorities. From that time, with but few exceptions, hardly a week elapsed without any cases arising, several of which were imported into the town, until the week ending December 23rd, 1893. In the subjoined table (and Chart III.) the number of persons attacked in each week is given, and also that of those who died, the deaths being those of the persons attacked in the week in question. The list includes not only the notified cases, but those which were not known to the authorities until later, and it comprises a total of 357, of whom 21 died.

Table XI.

Leicester, 1892–3.—Weekly Incidence of Cases of Small-pox.

*(See also Chart III.)**

—	Week ending—	Cases.	Deaths.
	1892.		
i	August 27	1	—
ii	September 3	—	—
iii	„ 10	3	1
iv	„ 17	—	—
v	„ 24	—	—
vi	October 1	1	—
vii	„ 8	1	—
viii	„ 15	2	—
ix	„ 22	2	—
x	„ 29	5	2
xi	November 5	5	1
xii	„ 12	1	1
xiii	„ 19	5	—
xiv	„ 26	2	—
xv	December 3	2	1
xvi	„ 10	3	—
xvii	„ 17	7	—
xviii	„ 24	2	—
xix	„ 31	6	—
	1893.		
xx	January 7	21	1
xxi	„ 14	11	—
xxii	„ 21	19	1
xxiii	„ 28	13	1
xxiv	February 4	12	1
xxv	„ 11	3	—
xxvi	„ 18	6	—
xxvii	„ 25	2	—
xxviii	March 4	5	—
xxix	„ 11	7	—
xxx	„ 18	2	—
xxxi	„ 25	5	—
xxxii	April 1	7	—
xxxiii	„ 8	7	—
xxxiv	„ 15	12	—
xxxv	„ 22	7	2
xxxvi	„ 29	10	1
xxxvii	May 6	7	1
xxxviii	„ 13	14	—
xxxix	„ 20	7	—
xl	„ 27	10	—
xli	June 3	10	1
xlii	„ 10	10	—
xliii	„ 17	19	—
xliv	„ 24	11	—
xlv	July 1	5	1
xlvi	„ 8	7	—
xlvii	„ 15	2	—
xlviii	„ 32	2	—
xlix	„ 29	6	—
l	August 5	2	—
li	„ 12	5	1
lii	„ 19	2	1
liii	„ 26	2	—
liv	September 2	2	—
lv	„ 9	2	—
lvi	„ 16	5	—
lvii	„ 23	5	—
lviii	„ 30	—	—
lix	October 7	2	—
lx	„ 14	3	—
lxi	„ 21	1	—
lxii	„ 28	2	1
lxiii	November 4	1	—
lxiv	„ 11	—	—
lxv	„ 18	2	—
lxvi	„ 25	5	1
lxvii	December 2	2	—
lxviii	„ 9	3	1
lxix	„ 16	2	—
lxx	„ 23	2	—
		357	21

* *Explanation of Chart III.:—*

This chart shows the number of cases (and deaths) arising in each week of the outbreak. The lower portion—in the same part—the vaccinative conditions being indicated. (See *Table*).

In Table XII. the cases are distributed amongst the months of their incidence, and it will be seen that the outbreak attained its height in January 1893, but that the disease was also disproportionately prevalent in the months of May and June.

Table XII.

Leicester.—Small-pox, 1892-3.

Monthly Incidence. (Chart IV. A.)

N.B.—Cases entered in month of onset of illness.

——	Cases.	Deaths.
1892.		
August	1	—
September	5	1
October	10	2
November	13	2
December	18	1
1893.		
January	69	4
February	20	—
March	24	—
April	39	4
May	43	1
June	48	1
July	18	—
August	12	2
September	12	—
October	8	1
November	10	1
December	7	1
	357	21

Sex and Age.—The number of males attacked with small-pox was 181; of females, 176. The mortality, however, was far higher in the female sex, viz., 14 deaths, or nearly 8 per cent., as compared with 7 deaths, or 3·8 per cent. of the males.

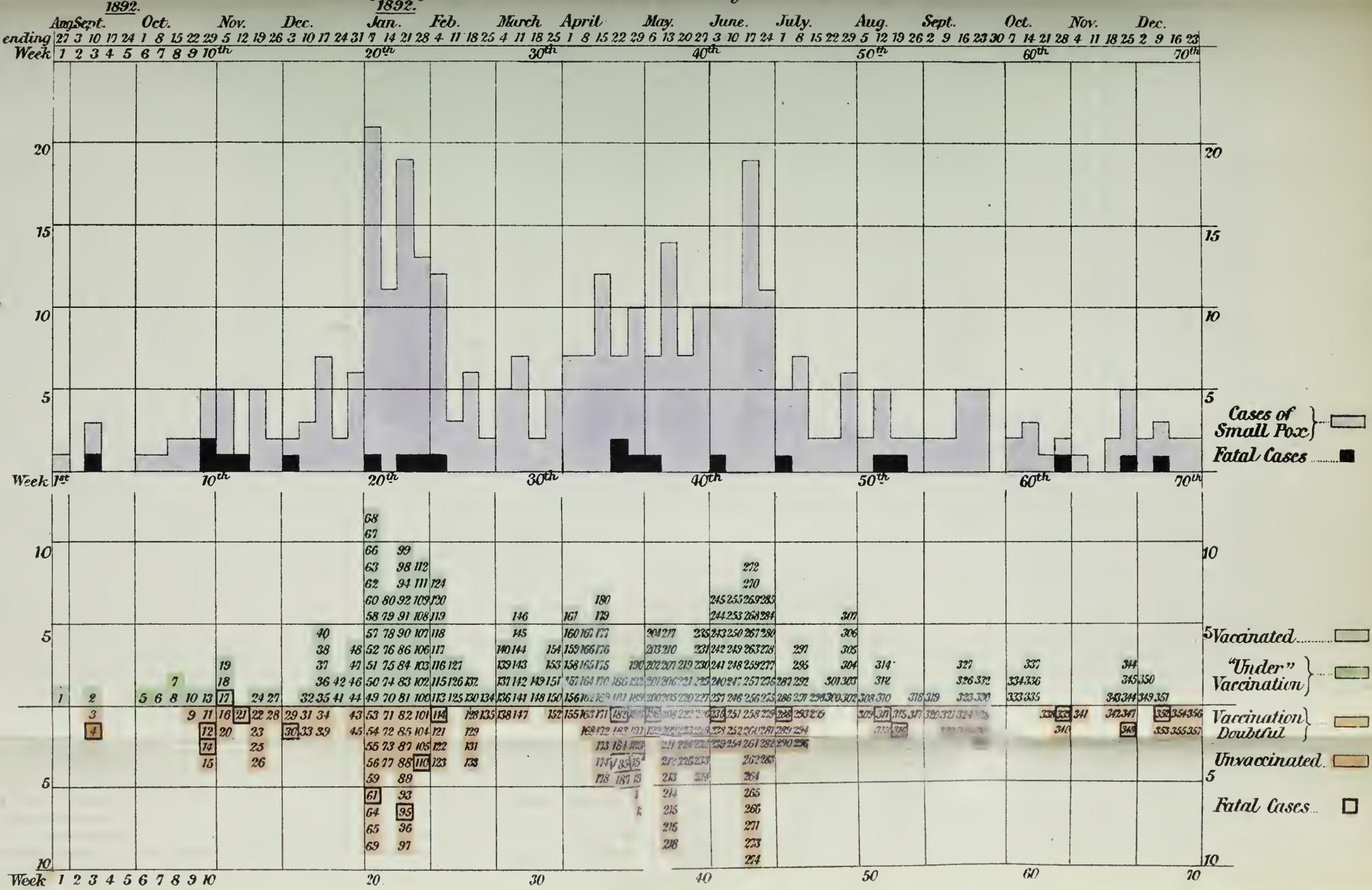
Table XIII.

Leicester.—Small-pox, 1892-3.

Table showing Ages of those Attacked in each Month. (Chart IV. B.)

—	Under 1 Year.		1 to 10 Years.		10 to 30 Years.		30 Years and upwards.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1892.								
August	—	—	—	—	—	—	1	—
September	1	—	—	—	2	—	2	1
October	—	—	6	2	2	—	2	—
November	—	—	7	1	1	—	5	1
December	—	—	6	1	8	—	4	—
1893.								
January	1	1	18	3	38	—	12	—
February	—	—	6	—	7	—	7	—
March	—	—	3	—	10	—	11	—
April	1	—	14	3	15	1	9	—
May	1	—	9	—	21	1	12	—
June	4	—	15	—	22	—	11	1
July	—	—	1	—	12	—	5	—
August	2	1	5	1	4	—	1	—
September	—	—	4	—	7	—	1	—
October	—	—	1	—	6	1	1	—
November	—	—	4	1	3	—	3	—
December	—	—	4	1	3	—	—	—
	6	2	103	13	161	3	87	3

ending August 27th 1892, to the Week ending December 23rd 1893.



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The age-distribution (see Tables XIII. and XIV.) shows that for both sexes—the largest number of cases in any decade—was from 0 to 10 years, viz., 109; the next at from 20 to 30, viz., 92; and the next from 10 to 20, viz., 69. In Table XIII. the relative monthly incidence of the disease amongst persons of different ages is shown, and (excluding August 1892) it will be found that, taking four periods of four months' each, the proportion of those attacked between the ages of 1 and 10 years was respectively 41·3 per cent., 26·9 per cent., 24·8 per cent., and 35·1 per cent., the preponderance at those ages during the first period being ascribable to the children who were infected in the hospital fever wards.

Table XIV.

Small-pox.—Age and Sex Distribution.

—	Males.		Females.		Both Sexes.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	2	—	5 4	2	6	2
1 to 5 years	17	2	18	5	35	7
5 to 10 „	28	2	3 9 40	4	68	6
10 to 15 „	17	1	19	—	36	1
15 to 20 „	16	—	17	—	33	—
20 to 30 „	44	1	48	1	92	2
30 to 40 „	27	—	18	1	45	1
40 to 50 „	17	—	10	1	27	1
50 to 60 „	8	1	2	—	10	1
60 to 70 „	4	—	—	—	4	—
70 and over	1	—	—	—	1	—
	181	7	176	14	357	21

Stated in Age-periods, the above figures would run:—

—	Males.		Females.		Both Sexes.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
At ages under 1 year	2	0	5 4	2	7 6	2
„ 1 to 10 years	45	4	5 7	9	10 2	13
„ 10 to 30 „	77	2	84	1	161	3
„ 30 years and upwards	57	1	30	2	87	3
	181	7	176	14	357	21

Type of Attacks.—Of the whole number of cases 7 were regarded as *malignant* (hæmorrhagic type), all of which were fatal; 89 may be considered as of *confluent* type, 14 fatal, 56 as *coherent*, 78 as *discrete*, whilst in no fewer than 127 the disease was *mild* in its course and sparse in the eruption.

The per-centage distribution was, therefore, as follows:—

Malignant	1·9 per cent.
Confluent	24·9 „
Coherent	15·6 „
Discrete	21·8 „
Mild	35·5 „

It is of interest to note that, if the period (exclusive of August 1892) be divided into four terms of four months each, the severer cases—malignant and confluent—predominated in the first and last of these terms (*see* Table XV.), being 45·6 per cent., 19 per cent., 24·7 per cent., and 43·2 per cent. respectively. This variation bears some correspondence with the variation in incidence in children, already mentioned, for from Table XVI. it appears that the highest numbers, absolute and relative, of severe cases were met with in the young.

Table XV.

Leicester.—Small-Pox, 1892–3.

Table showing Proportionate Type of Disease in each Month. (Chart IV. C.)

—	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1892. August	—	—	—	—	—	—	—	—	1	—	1	—
September	—	—	3	1	—	—	1	—	1	—	5	1
October	1	1	5	1	2	—	1	—	1	—	10	2
November	—	—	8	2	3	—	1	—	1	—	13	2
December	—	—	4	1	3	—	4	—	7	—	18	1
1893. January	1	1	13	3	10	—	13	—	32	—	69	4
February	—	—	4	—	4	—	3	—	9	—	20	—
March	—	—	2	—	2	—	9	—	11	—	24	—
April	2	2	7	2	9	—	10	—	11	—	39	4
May	1	1	10	—	9	—	11	—	12	—	43	1
June	—	—	12	1	6	—	14	—	16	—	48	1
July	—	—	2	—	5	—	4	—	7	—	18	—
August	—	—	5	2	—	—	2	—	5	—	12	2
September	—	—	5	—	—	—	1	—	6	—	12	—
October	—	—	2	1	—	—	2	—	4	—	8	1
November	1	1	4	—	2	—	1	—	2	—	10	1
December	1	1	3	—	1	—	1	—	1	—	7	1
	7	7	89	14	56	—	78	—	127	—	357	21

Table XVI.

Type of Small-Pox.—Age Distribution.

—	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	1	1	2	1	2	—	—	—	1	—	6	2
1–5	2	2	17	5	8	—	4	—	4	—	35	7
5–10	2	2	30	4	12	—	16	—	7	—	68	6
10–15	1	1	9	—	7	—	9	—	10	—	36	1
15–20	—	—	6	—	3	—	4	—	20	—	33	—
20–30	1	1	11	1	10	—	19	—	51	—	92	2
30–40	—	—	7	1	6	—	17	—	15	—	45	1
40–50	—	—	6	1	4	—	4	—	13	—	27	1
50–60	—	—	1	1	3	—	2	—	4	—	10	1
60–70	—	—	—	—	—	—	3	—	1	—	4	—
70 and over	—	—	—	—	—	—	—	—	1	—	1	—
	7	7	89	14	56	—	78	—	127	—	357	21

Thus at ages:—

—	Under 1 Year.	1 to 10 Years.	10 to 30 Years.	30 Years and upwards.
	Per cent.	%	%	%
Malignant	1 or ~~16·6~~ 14·3	4 or 3·9	2 or 1·2	0 —
Confluent	2 or ~~33·3~~ 28·6	47 or 46·	26 or 16·1	14 or 16·
Coherent	3 2 or ~~35·3~~ 42·8	21 or 19·6	20 or 12·4	13 or
Discrete	0 —	20 or 19·6	32 or 19·9	26 or 2
Mild	1 or ~~16·6~~ 14·3	11 or 10·7	81 or 50 3	34 or
	6	103	161	87

Vaccination Data of those Attacked with Small-pox.

In Table XVII. and Chart II. the weekly totals are divided into four categories, according to the condition of the subjects *quâ* vaccination. These categories consist of (*a*) those presenting evidence of having been vaccinated; (*b*) those undergoing primary vaccination when attacked; (*c*) where the fact of vaccination was uncertain or doubtful; and (*d*) the unvaccinated.

Table XVII.

Vaccination Data of Cases arising in each Week.

(Chart III.)

Week.	Vaccinated.		Under-Vaccination.		Doubtful Vaccination.		Un-vaccinated.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
i	1	—	—	—	—	—	—	—
ii	—	—	—	—	—	—	—	—
iii	1	—	—	—	1	1	1	—
iv	—	—	—	—	—	—	—	—
v	—	—	—	—	—	—	—	—
vi	—	—	1	—	—	—	—	—
vii	1	—	—	—	—	—	—	—
viii	1	—	1	—	—	—	—	—
ix	1	—	—	—	—	—	1	—
x	1	—	—	—	—	—	4	2
xi	3	1	—	—	—	—	2	—
xii	—	—	—	—	—	—	1	1
xiii	1	—	—	—	—	—	4	—
xiv	1	—	—	—	—	—	1	—
xv	—	—	—	—	—	—	2	1
xvi	1	—	—	—	—	—	2	—
xvii	5	—	—	—	—	—	2	—
xviii	2	—	—	—	—	—	—	—
xix	4	—	—	—	—	—	2	—
xx	12	—	—	—	—	—	9	1
xxi	7	—	—	—	—	—	4	—
xxii	10	—	—	—	—	—	9	1
xxiii	9	—	—	—	—	—	4	1
xxiv	8	—	—	—	—	—	4	1
xxv	3	—	—	—	—	—	—	—
xxvi	2	—	—	—	—	—	4	—
xxvii	1	—	—	—	—	—	1	—
xxviii	4	—	—	—	—	—	1	—
xxix	6	—	—	—	—	—	1	—
xxx	2	—	—	—	—	—	—	—
xxxi	4	—	—	—	—	—	1	—
xxxii	6	—	—	—	—	—	1	—
xxxiii	5	—	—	—	—	—	2	—
xxxiv	7	—	—	—	—	—	5	—
xxxv	9	—	—	—	—	—	5	2
xxxvi	2	—	1	—	—	—	7	1
xxxvii	5	—	—	—	—	—	2	1
xxxviii	5	—	—	—	—	—	9	—
xxxix	2	—	1	—	—	—	4	—
xl	5	—	—	—	—	—	5	—
xli	7	—	—	—	—	—	3	1
xlii	7	—	—	—	—	—	3	—
xliii	9	—	—	—	—	—	10	—
xliv	7	—	—	—	—	—	4	—
xlv	2	—	—	—	—	—	3	1
xlvi	4	—	—	—	—	—	3	—
xlvii	1	—	—	—	—	—	1	—
xlviii	2	—	—	—	—	—	—	—
xlix	6	—	—	—	—	—	—	—
l	1	—	—	—	—	—	1	—
li	3	—	—	—	—	—	2	1
lii	—	—	—	—	—	—	2	1
liii	1	—	—	—	—	—	1	—
liv	1	—	—	—	—	—	1	—
lv	—	—	—	—	—	—	2	—
lvi	3	—	—	—	—	—	2	—
lvii	2	—	—	—	—	—	3	—
lviii	—	—	—	—	—	—	—	—
lix	2	—	—	—	—	—	—	—
lx	3	—	—	—	—	—	—	—
lxi	—	—	—	—	—	—	1	—
lxii	—	—	—	—	—	—	2	1
lxiii	—	—	—	—	—	—	1	—
lxiv	—	—	—	—	—	—	—	—
lxv	1	—	—	—	—	—	1	—
lxvi	3	—	—	—	—	—	2	1
lxvii	2	—	—	—	—	—	—	—
lxviii	1	—	—	—	—	—	2	1
lxix	—	—	—	—	—	—	2	—
lxx	—	—	—	—	—	—	2	—
	198	1	4	—	1	1	154	19

Thus the vaccinated numbered 198, or 55·4 per cent. of all attacked; those "under vaccination," 4, or 1·1 per cent.; "doubtful" vaccination, 1, or 0·2 per cent.; unvaccinated, 154, or 43·1 per cent.

The mortality amongst the vaccinated was 0·8 per cent.; amongst the unvaccinated, 12·3 per cent. The single case in which the fact of vaccination was doubtful proved fatal (No. 4, *v. ante*). There were no deaths amongst the four who were "under" vaccination.

Table XVIII.

Leicester.—Small-pox, 1892–3.

Monthly Incidence.—Vaccination Data.

(Chart IV. D.)

Month.	Vaccinated.		Under Vaccination.		Doubtful Vaccination.		Un-vaccinated.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1892.								
August	1	—	—	—	—	—	—	—
September	2	—	1	—	1	1	1	—
October	3	—	1	—	—	—	6	2
November	5	1	—	—	—	—	8	1
December	11	—	—	—	—	—	7	1
1893.								
January	42	—	—	—	—	—	27	4
February	12	—	—	—	—	—	8	—
March	20	—	—	—	—	—	4	—
April	17	—	1	—	—	—	21	4
May	21	—	1	—	—	—	21	1
June	28	—	—	—	—	—	20	1
July	14	—	—	—	—	—	4	—
August	5	—	—	—	—	—	7	2
September	5	—	—	—	—	—	7	—
October	5	—	—	—	—	—	3	1
November	6	—	—	—	—	—	4	1
December	1	—	—	—	—	—	6	1
	198	1	4	—	1	1	154	19

Explanation of Chart IV:—
In this chart the monthly distribution of the cases of small-pox is represented. A.—Total numbers and mortality. B.—Numbers at different age-periods. C.—Numbers of different types of the disease. D. Numbers vaccinated and unvaccinated. The fatal cases in B., C., and D., shown by the sign +.

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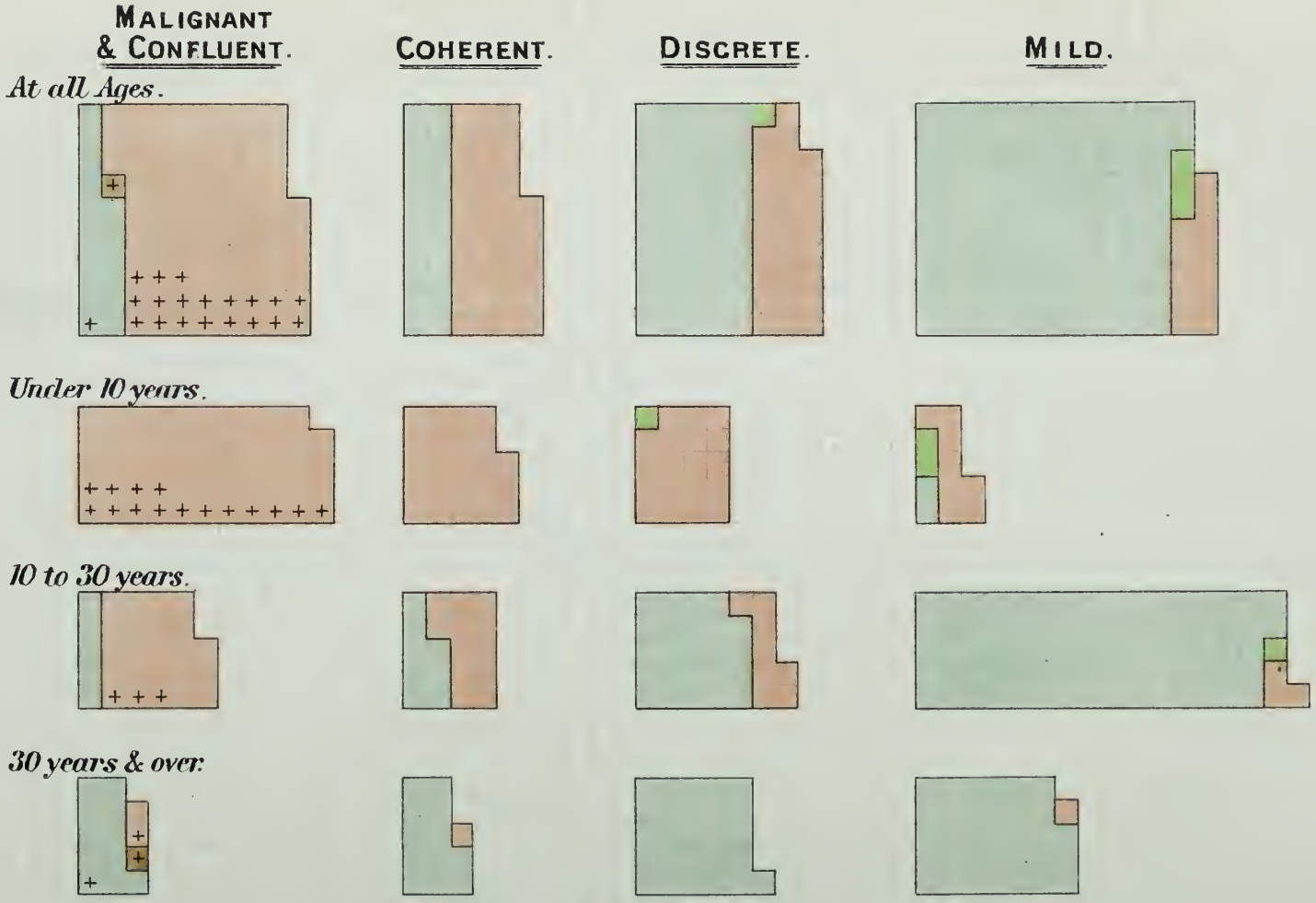
Chart IV.

LEICESTER, 1892-93.

Type and Fatality of Small Pox in regard to Age & Vaccination



In Table XVIII. the data furnished in Table XVII. are arranged in the months of the occurrence of the cases.

Dividing the whole period—September 1892 to December 1893—into four terms of four months each, it will be found that the proportion of vaccinated and unvaccinated in each term was as follows:—Vaccinated, 45·6 per cent., 60 per cent., 56 per cent., and 46 per cent.; unvaccinated, 48 per cent., 39·4 per cent., 43 per cent., and 54 per cent.

§12. *Vaccination in Relation to Type of Attack.*

In Tables XIX. and XX. and Chart V. the facts as to the relative incidence of the different forms of small-pox in the various classes of vaccinated and unvaccinated are set forth. These figures show that in children, who, with four exceptions, were all unvaccinated, the proportion of severe cases were very much higher than in adults, amongst whom the proportions of vaccinated and unvaccinated were almost reversed; and that above the age of 30 twice as many confluent cases occurred amongst the vaccinated class than below that age.

TABLE XIX.

CASES OF SMALL-POX.

AGE AND VACCINATION.

—	Vaccinated.		Under Vaccination.		Doubtful Vaccination.		Unvaccinated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths
Under 1 year	—	—	1	—	—	—	5	2	6	2
1 to 5 years	—	—	1	—	—	—	34	7	35	8
5 „ 10 „	2	—	1	—	—	—	65	6	68	6
10 „ 15 „	9	—	—	—	—	—	27	1	36	1
15 „ 20 „	24	—	1	—	—	—	8	—	33	—
20 „ 30 „	81	—	—	—	—	—	11	2	92	2
30 „ 40 „	44	—	—	—	—	—	1	1	45	1
40 „ 50 „	24	1	—	—	—	—	3	—	27	1
50 „ 60 „	9	—	—	—	1	1	—	—	10	—
60 „ 70 „	4	—	—	—	—	—	—	—	5	—
70 and over	1	—	—	—	—	—	—	—	1	—
	198	1	4	—	1	1	154	19	357	21

TABLE XX.

VACCINATION and TYPE of SMALL-POX.

—	Vaccinated.					Under Vaccination.					Doubtful Vaccination.					Un-vaccinated.					Total.					—
	Malignant.	Confluent.	Coherent.	Discrete.	Mild.	Malignant.	Confluent.	Coherent.	Discrete.	Mild.	Malignant.	Confluent.	Coherent.	Discrete.	Mild.	Malignant.	Confluent.	Coherent.	Discrete.	Mild.	Malignant.	Confluent.	Coherent.	Discrete.	Mild.	
Under 1 year										1						1	2	2			1	2	2		1	6
1 to 5										1						2	17	8	4	3	2	17	8	4	4	35
5 „ 10					2				1							2	30	13	15	5	2	30	13	16	7	68
10 „ 15				2	7											1	9	7	7	3	1	9	7	9	10	36
15 „ 20		1	1	3	19					1							5	2	1			6	3	4	20	33
20 „ 30		4	7	19	51											1	7	3			1	11	10	19	51	92
30 „ 40		6	6	17	15												1					7	6	17	15	45
40 „ 50		5	3	4	12												1	1		1		6	4	4	13	27
50 „ 60			3	2	4							1										1	3	2	4	10
60 „ 70				3	1																			3	1	4
70 and over					1																				1	1
	—	16	20	50	112				1	3		1				7	73	36	27	12	7	89	56	78	127	357

And stated in age periods (*see* Chart IV.):—

TABLE XX. A.

—	Vaccinated.		Under Vaccination.		Doubtful Vaccination.		Unvaccinated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
0 to 10 years:—										
Malignant	—	—	—	—	—	—	5	5	5	5
Confluent	—	—	—	—	—	—	49	10	49	10
Coherent	—	—	—	—	—	—	23	—	23	—
Discrete	—	—	1	—	—	—	19	—	20	—
Mild	2	—	2	—	—	—	8	—	12	—
	2	—	3	—	—	—	104	15	109	15
10 to 30 years:—										
Malignant	—	—	—	—	—	—	2	2	2	2
Confluent	5	—	—	—	—	—	21	1	26	1
Coherent	8	—	—	—	—	—	12		20	—
Discrete	24	—	—	—	—	—	8		32	—
Mild	77	—	1	—	—	—	3	—	81	—
	114	—	1	—	—	—	46	3	161	3

Explanation of Chart V.:—

This Chart shows the absolute number of cases of each type in each class.

TABLE XX.—*continued.*

	Vaccinated.		Under Vaccination.		Doubtful Vaccination.		Unvaccinated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
30 years and over:—										
Malignant	—	—	—	—	—	—	—	—	—	—
Confluent	11	1	—	—	1	1	2	1	14	3
Coherent	12	—	—	—	—	—	1	—	13	—
Discrete	26	—	—	—	—	—	—	—	26	—
Mild	33	—	—	—	—	—	1	—	34	—
	82	1	—	—	1	1	4	1	87	3
At all ages:—										
Malignant	—	—	—	—	—	—	7	7	7	7
Confluent	16	1	—	—	1	1	72	12	89	14
Coherent	20	—	—	—	—	—	36	—	56	—
Discrete	50	—	1	—	—	—	27	—	78	—
Mild	112	—	3	—	—	—	12	—	127	—
	198	1	4	—	1	1	154	19	357	21

Comparison of Vaccinated and Unvaccinated as to Type of Attack.

In analysing the proportionate distribution of the cases of small-pox at different age-periods, we have the following results, which are represented diagrammatically on the accompanying plan (Chart VI.):—

Vaccinated Class (198 Cases).

Type of Small-pox.	Under 10 Years.	10 to 30 Years.	30 Years and upwards.	At all Ages.
Confluent	—	5 or 4·4 p.c.	11 or 13·4 p.c.	16 or 8·0 p.c.
Coherent	—	8 „ 7·0 „	12 „ 14·6 „	20 „ 10·1 „
Discrete	—	24 „ 21·0 „	26 „ 31·7 „	50 „ 25·2 „
Mild	2 or 100 p.c.	77 „ 67·5 „	33 „ 40·2 „	112 „ 56.5 „
	2	114	82	198

Of this total, 182 have the number of primary vaccination cicatrices recorded—viz.: 6 with 1 cicatric, 42 with 2 cicatrices, 64 with 3 cicatrices, and 70 with 4 or more cicatrices.

Having One Primary Vaccination Cicatric (6 Cases).

Type of Small-pox.	Under 10 Years.	10 to 30 Years.	30 Years and upwards.	At all Ages.
Confluent	No Cases.	1 or 20·0 p.c.	—	1 or 16·6 p.c.
Coherent		1 „ 20·0 „	—	1 „ 16·6 „
Discrete		1 „ 20·0 „	—	1 „ 16·6 „
Mild		2 „ 40·0 „	1 or 100 p.c.	3 „ 50·0 „
		5	1	6 „ 50·0 „

Having Two Primary Vaccination Cicatrices (42 Cases).

Type of Small-pox.	Under 10 Years.	10 or 30 Years.	30 Years and upwards.	At all Ages.
Confluent	No Cases.	2 or 8·7 p.c.	6 or 31·6 p.c.	8 or 19·0 p.c.
Coherent		—	3 „ 15·8 „	3 „ 7·0 „
Discrete		5 „ 21·7 „	6 „ 31·6 „	11 „ 26·2 „
Mild		16 „ 69·5 „	4 „ 21·0 „	20 „ 47·6 „
		23	19	42

Having Three Primary Vaccination Cicatrices (64 Cases.)

Type of Small-pox.	Under 10 Years.	10 to 30 Years.	30 Years and upwards.	At all Ages.
Confluent	No Cases.	1 or 3·4 p.c.	4 or 11·4 p.c.	5 or 7·8 p.c.
Coherent		4 „ 13·8 „	6 „ 17·1 „	10 „ 15·6 „
Discrete		6 „ 20·0 „	13 „ 37·0 „	19 „ 29·7 „
Mild		18 „ 62·1 „	12 „ 34·3 „	30 „ 46·9 „
		29	35	64

Explanation of Chart VI.:—
This chart shows the proportion of cases of small pox of different types, at different ages in the vaccinated and unvaccinated respectively.

Having Four or more Primary Vaccination Cicatrices (70 Cases).

Type of Small-pox.	Under 10 Years.	10 to 30 Years.	30 Years and upwards.	At all Ages.
Confluent	—	1 or 1·9 p.c.	1 or 6·0 p.c.	2 or 2·8 p.c.
Coherent	—	3 „ 5·9 „	3 „ 17·6 „	6 „ 8·5 „
Discrete	—	11 „ 21·5 „	5 „ 29·4 „	16 „ 22·8 „
Mild	2	36 „ 70·6 „	8 „ 47·0 „	46 „ 65·7 „
		51	17	70

These figures, small as they are, show a general proclivity to a greater proportion of severe cases beyond the age of 30 years than below it; and also a diminishing ratio of these severe cases in each age-period *pari passu* with an increase in the number of vaccination cicatrices.

These results may be contrasted with those yielded by a similar analysis of the unvaccinated subjects.

Unvaccinated Class (154 Cases).

Type of Small-pox.	Under 10 Years.	10 to 30 Years.	30 Years and upwards.	At all Ages.
Confluent and Malignant.	54 or 51·9 p.c.	23 or 50·0 p.c.	2 or 50·0 p.c.	79 or 51·3 p.c.
Coherent	23 „ 22·1 „	12 „ 26·1 „	1 „ 25·0 „	36 „ 23·3 „
Discrete	19 „ 18·2 „	8 „ 17·4 „	—	27 „ 17·5 „
Mild	8 „ 7·7 „	3 „ 6·5 „	1 „ 25·0 „	12 „ 7·7 „
	104	46	4	154

Here we find a rather striking uniformity in the distribution of the types of small-pox at different age-periods, viz., about one-half being confluent (and malignant), one-fourth coherent, one-sixth discrete, and one-twelfth of the mildest type.

Houses invaded by Small-pox.

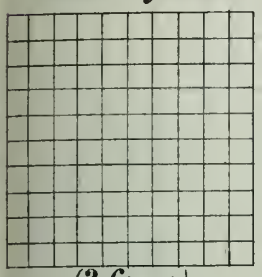
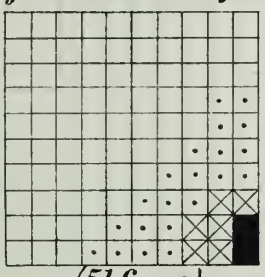
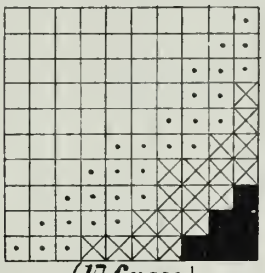
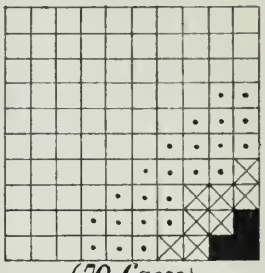
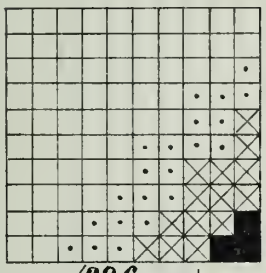
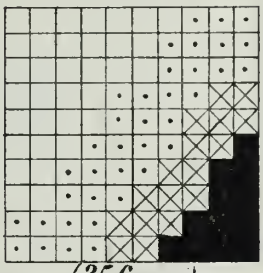
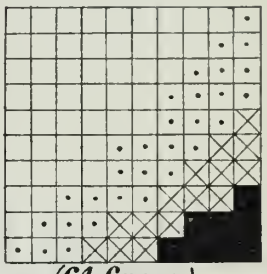
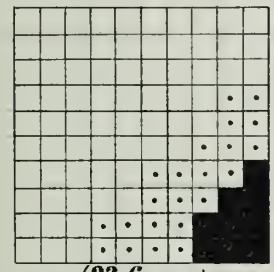
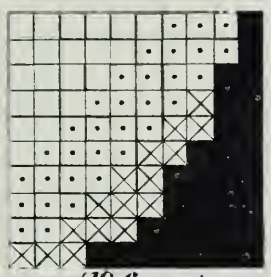
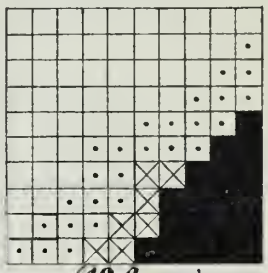
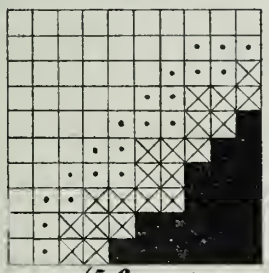
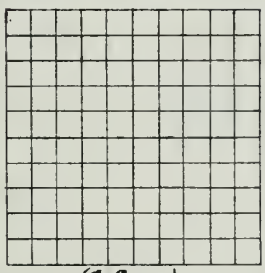
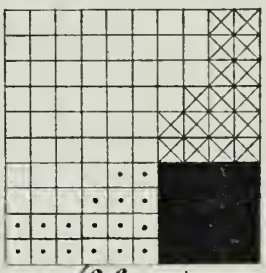
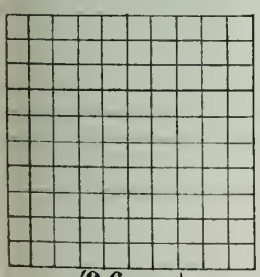
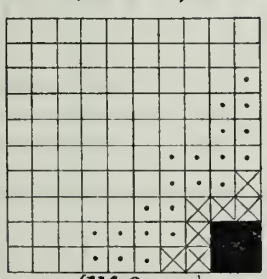
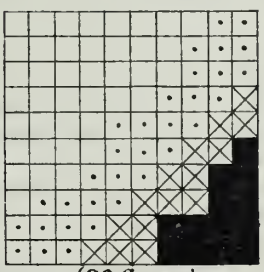
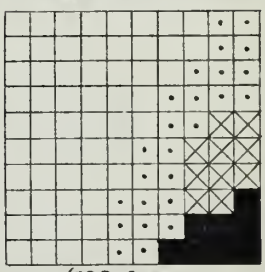
The following list of the houses invaded by small-pox supplements the information already furnished in the Table of Cases and the particulars of the outbreak. This list has been prepared in part from returns furnished to me of the names and ages of every inmate of an infected house with particulars as to their vaccination; and in part from a personal inspection of the houses which I made at the close of the inquiry, in company with the chief sanitary inspector, Mr. Braley. It will be seen from the brief notes which are appended that the majority of the dwellings inspected were in a good sanitary state, and in but a few was there any over-crowding of the inmates.

I have taken for purposes of analysis 193 of these households, comprising 1,234 inhabitants; the reason for this selection being the lack of information regarding the five others, Nos. 1, 7, 8, 47, and 71. Moreover three of them were common lodging-houses, the largest of which was No. 7, into which small-pox was introduced on two occasions, the total number of cases occurring in this place being 12. Ten cases were sent from the workhouse, and 11, which arose at the hospital, were retained there and did not return to their homes. Thirty-six cases are thus accounted for, leaving 321 in connexion with the 193 households analysed; but one of these cases was admitted into hospital twice (viz., house No. 36, case 60 (and 111)), having apparently been re-infected.

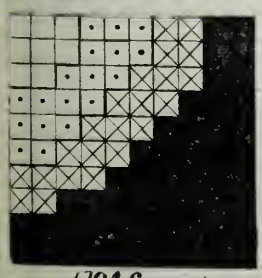
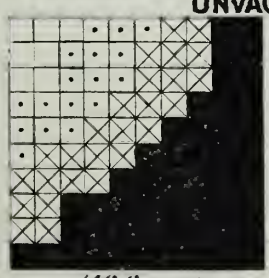
Thus we have 193 houses with 1,234 inmates, of whom 320 were attacked.

DIAGRAM, *showing the Proportion of Cases, of Small Pox, of different Types which occurred in Vaccinated and Unvaccinated Persons at all and certain Specified Ages.*

VACCINATED.

Under 10 years.	*Aged 10 & under 30 years.*	*Aged 30 Years & upwards.*	*All Ages.*
			
(2 Cases.)	*(51 Cases.)*	*(17 Cases.)*	*(70 Cases.)*
No Cases.			
	(29 Cases.)	*(35 Cases.)*	*(64 Cases.)*
No Cases.			
	(23 Cases.)	*(19 Cases.)*	*(42 Cases.)*
No Cases.			
	(5 Cases.)	*(1 Case.)*	*(6 Cases.)*
			
(2 Cases.)	*(114 Cases.)*	*(82 Cases.)*	*(198 Cases.)*

UNVACCINATED.

			
(104 Cases.)	*(46 Cases.)*	*(4 Cases.)*	*(154 Cases.)*

Confluent (& Malignant) type of Small Pox ■ *Discrete type of Small Pox* ⊡

Coherent type of Small Pox ⊠ *Mild type of Small Pox* □

to face page 46.

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§13. Leicester.—Small-Pox, 1892-3.

List of Houses Invaded, with Details as to Vaccination of their Inmates.

Ref. to House List.	Street.	Date of Infection.	Inmates.				Attacked with Small-Pox.*				Persons quarantined at Hospital.	Sanitary Condition of House, &c.
			Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.	Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1	Workhouse and Britannia Street, Court E.	1892. Aug. 21	—	—	—	—	1					Large ill-paved court; open ashpit; pail clean; 2 rooms, old.
2	„ „	Sept. 4	2				2				6	4 rooms; old house; open asbpit; pail clean.
3	„ Court A.	„ 5	1		1	1			5	3	2	Old 2-roomed dwelling; neglected; recent privies.
	Workhouse Infirmary.		—	—	—	—		4				
4	Elm Street	„ 28	4		2		6		7		5	4 rooms, fairly clean; w.c.; covered ashpit.
5	Crane Street	Oct. 12	3				8				5	4 rooms, clean; new buildings; w.c.; yard to 5 houses.
6	„ „	„ 17	4			1				9	5	Do. do. do.
7	Lee Street, C. L. H.	„ 18	—	—	—	—	10, 19, 62, 78, 109, 112, 132, 141, 142, 144, 145, 151.				1	
	Fever Hospital	„ 26	—	—	—	—	37, 66, 106, 200.			11, **12**, **14**, 15, 16, **21**, 25.		
8	Newport Street	„ 27					13					6 rooms; w.c.; water supply good.
9	Caroline Street	Nov. 2	3				**17**				2	Small house in large well-paved court; pail system; good water supply.
10	Mansfield Street	„ 3	3			1	18				3	Large court to 2 houses; 4 rooms; pail system; open ashpit.
11	Peel Street	„ 3	4			1				20	6	Large well-paved yard, clean; 4 rooms; pail system; open ashpit.
	Workhouse	„ 12	—	—	—	—	35, 68, 99, 118, 125, 146, 154.			22		
12	Kent Street	„ 13	4			3	32			23	10	House not visited.
13	Garfield Street	„ 14	10			1	24				10	Wide well-paved street; 7 rooms in house; clean; water supply good; w.c.
14	Nelson Street	„ 18	5			3				26, 31.	7	Small yard to 2 houses; 4 rooms; pail system; open ashpit.
15	Brookhouse Avenue	„ 19	2		1		27					Good house, about 7 rooms; w.c. outside; water supply good.
16	Preston Street	„ 23	5			3				28	7	Yard to 2 houses; 6 rooms; w.c.
17	Stanley Street	„ 29	3		3	1	36			29		House not visited.
18	Milton Street	Dec. 2	7			3				**30**	9	Clean, well kept; 6 rooms; w.c. and urinal in court.
19	Beatrice Road	„ 10	4			2	44			33, 59.	6	6 rooms recently built; good condition; open site.
20	Norfolk Street	„ 11	2			11				34, 77, **114**, 122, 123, 128.		Good; clean; garden at back.
21	Braunstone Gate	„ 15	8			2	38, 67, 94.			53, **61**.		Large house of good class; w.c. within and without; bath room.
22	Baker Street	„ 15	5			2	48			39, 43.	1	Ill-paved street; narrow yard; small house; fair; pail system.
23	Alexandra Street	„ 20	5				40, 51, 52, 92.				4	4 houses in well-paved yard; pail system; open ashpit; house fairly clean.
24	Pool Road	„ 23	2			2	41, 98.			65, 96.		New 6-roomed house; clean; w.c.; covered ashpit; water supply good.
25	Harrison Street	„ 30	3			1	42				3	6 rooms; clean; paved yard; w.c.; dustbins.
26	Mansfield Street	„ 31	3			6				45, 64, 82, 85, 87.	7	Large yard in front; good buildings; clean; well kept.
27	Western Road	„ 31	5			4	46					New house; in good sanitary condition.
28	Dryden Street	„ 31	3		1		47, 84					One of 8 houses in yard; 4 rooms; open ash-pit.
29	Western Road	1893. Jan. 1	6				49, 81					One of 7 houses in row; old poor ventilation; pails.
30	Fitzroy Street	„ 2	7	1		2	50					Yard to 4 houses; 4 rooms; pail system; dustbins.
31	Wharf Street	„ 3	5			1				54		New house; shop; good sanitary state.
32	Samuel Street	„ 3	5			3	90, 91			55, 93, 101	3	Yard to 5 houses; 4 rooms; pails, dustbin.
33	Metcalf Street	„ 4	1			3				56, 89		Old street; 5 houses in yard; open ash-pit; ill-kept garden; pails.
34	Baker Street	„ 4	5		3		57				7	As No. 22, but ill-kept.
35	Pasture Lane	„ 4	8				58					Small paved court; neglected; dirty; pails.
36	Abbey Lane	„ 5	5			1	60 (111)				5	6 rooms; w.c.; clean and sanitary.
37	Bede Street	„ 5	7				63					New well-kept house.
38	Beatrice Road	„ 7	1			7				69		6 rooms; w.c.; garden; good state.
39	Woodby Street	„ 8	4				70				3	Yard to 6 houses; low built; ill-ventilated.
40	Banford Street	„ 8	3			2				71	9	Not seen.
41	Flint Street	„ 9	4			3	126			72, 104	5	Yard to 6 houses; ill-drained; w.c.; dustbins.
42	Little Holm Street	„ 9	2	1		4				73	5	New house; good work.
43	Littleton Street	„ 9	7			4	74				10	6 rooms; yard dirty; pails; dustbin.

* The figures in these columns refer to Table of Cases. Those in leaded type are fatal cases.

TABLE of HOUSES INVADED, with DETAILS as to VACCINATION of their INMATES—*continued.*

Ref. to House List.	Street.	Date of Infection.	Inmates.				Attacked with Small-Pox.*				Persons quarantined at Hospital.	Sanitary Condition of House, &c.
			Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.	Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
44	Bath Street	Jan. 9	8			1	75					Yard not paved; ill-drained; old ill-kept house.
45	Baker Street	„ 9	3			3	76				5	House had been pulled down when place visited.
46	High Cross Street	„ 13	4		1		79					Not visited.
47	Brittania Street, C.L.H.	„ 13	—	—	—	—	80					Lodging-house (52 males); small yard; 3 w.c.'s.
48	Curzon Street	„ 16	3				83					6 rooms; cleanly; well kept; w.c.; dustbin.
49	Heanor Street	„ 17	8			1	86					6 rooms; cleanly; well kept; w.c.; dustbin.
50	Grant Street	„ 17	5			3	119, 124			88	7	Rooms 3; ill-kept.
51	Burgess Street	„ 19	3			1				**95**		4 houses to yard; small and low; w.c.; ash-pit.
52	Metcalf Street	„ 20	3			6				97	8	See No. 33.
53	Argyll Street	„ 22	6			1	100				6	Yard to 4 houses; yard neglected; house fair; pails; open ashpit.
54	Dorset Street	„ 22	2			5	102				6	Yard to 4 houses; w.c.; dustbin; fair.
55	Sanvey Gate	„ 22	2			3	103					Confined court; dirty house; low rooms; pail system; dustbins.
56	Archdeacon Lane	„ 23	1			1				105		Old back-to-back house; ill-kept and dirty; pails.
57	Grundon Street	„ 26	5				107					On riverside; paved yard; pails; open ashpit; fairly kept.
58	Brandon Steeet	„ 27	6				108					6 rooms; good condition.
59	Blackfriars Street	„ 28	2			3	130			**110**	4	Court with several houses; pail system; open ashpit.
60	Salisbury Road	„ 29	18		1		113					Not visited.
61	Alice Street	„ 31	2				115					4 houses to yard; rather dirty; 2 w.c.'s.
62	Brandon Street	„ 31	2		1		116					As No. 28.
63	Pingle Street	Feb. 3	2			3	120				4	Paved yard to 5 houses; garden behind; good.
64	Coventry Street	Jan. 31	6				117					Yard to 2 houses; 9 rooms; fair; w.c.
65	Brandon Terrace	Feb. 4	2		2	3				121, 131		7 rooms; good sanitary state.
66	Curley Street	„ 11	5			1	127				5	Yard to 3 houses; garden plots; pails; open ashpit.
67	Dorset Street	„ 12	2			5	136			129	6	6 rooms; rather dirty; pails; small yard.
68	Gosling Street	„ 18	2			1	143			133		Not seen.
69	Brandon Street	„ 23	3			2	134, 148, 153			147, 152		As No. 58.
70	Buckingham Street	„ 25				5				135, 155	7	Yard to 6 houses; good sanitary state.
	Britannia Street, C.L.H.	March 1	—	—	—	—	137					Lodging-house; fairly new; small yard; w.c.
72	Moreton Road	„ 1	4			2				138		5 rooms; clean; fairly new; pails.
73	Victoria Avenue	„ 2	9		1		139, 140					Not visited.
74	Bath Street	„ 19	6				149, 156, 161					Large yard and stores; roomy; well kept.
75	Arthur Street	„ 21	10				150					Clean; good sanitary state.
76	Ruby Street	„ 27	3			2	157					Ditto.
77	Martin Street	„ 27	7			1	158, 177			168	5	Yard to 2 houses; clean; good state.
78	Abbey Lane	„ 28	6			1	159					Old buildings; well marked; pails.
79	All Saints' Road	„ 29	3			1	160					Yard to 4 houses; pails; fair.
80	Court D, Burley's Lane.	April 2	2			1	162				1	2 rooms; no back; side of court; pails; open ashpit.
81	Court A, Woodley Street.	„ 3	1			5				163, **185**	5	Court with 10 houses; no backs; pails.
82	Gresham Street	„ 3	2			3	164			183, 197		6 rooms; w.c.; ashpits in yards.
83	Belper Street	„ 4	3		2	2	165, 179		190	173, 174	1	6 rooms; new house; very clean; w.c.
84	Hinckley Road	„ 5	8			2	166, 186			**182,** 187		7 rooms; well kept; w.c. in yard.
85	Vernon Road	„ 7	5				167, 169, 170				2	Not seen.
86	Rolleston Street	„ 10	2			4	189			171, 172, 193.		Unpaved yard; pails; 6 rooms; wash-house.
87	Burgrave Street	„ 10	3			2	175, 237			258		Fairly new; well kept; sanitary.
88	Court A., Bath Street	„ 11	2			2	176					Old house; 3 rooms; w.c.; paved court.
89	Cromwell Road	„ 13	2			4				178		Not seen.
90	Knighton Church Road.	„ 14	4			3	180			**194, 198.**		Do.
91	Hazel Street	„ 16	6			3	181					Do.
92	Titchborne Street	„ 17	1			2				184		Large yard to 4 houses; w.c.; dust-bin; good drainage.
93	Simpson Street	„ 23	3			2				188		Yard to 5 houses; house fairly clean; pails.
94	Gold Street	„ 25	2			6				191, 209, 218.		Yard to 3 houses; 5 rooms; fair; pails.
95	Granby Avenue	„ 25	8				192, 204					Good; clean; 6 rooms; at back of Burgrave Street.
96	Queen Street	„ 27	1	1		2				195		4 houses to yard; spring water; pails; well kept.
97	Victoria Road	„ 28	3			4				196, 222, 223.		Shop; 6 rooms: w.c.

* The figures in these columns refer to Table of Cases. Those in leaded type are fatal cases.

TABLE of HOUSES INVADED, with DETAILS as to VACCINATION of their INMATES—*continued.*

Ref. to House List.	Street.	Date of Infection.	Inmates.				Attacked with Small-Pox.*				Persons quarantined at Hospital.	Sanitary Condition of House, &c.
			Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.	Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.		
1	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
98	Ruby Street	April 30	5			4	220			199		Clean; garden; wash-house; w.c.
99	Ridley Street	May 2	11			2	201					New built; 6 rooms; w.c.
100	Court D, Burley's Lane.	„ 3	3				202					Yard at back full of outbuildings; old; neglected; pails.
101	Mitre and Keys Yard.	„ 5	4			1	203					Old, but clean house; small rooms; pails; open ashpit.
102	Mere Road	„ 8	4			3	205					Good; very clean; on rising ground.
103	Harrison Street	„ 8	3				206					Well kept; 6 rooms; w.c.
104	Sheridan Road	„ 8	5		4		207, 217		219			Not seen.
105	Victoria Road	„ 10	3	1		3				208	6	Yard to 4 houses; ill-kept.
106	Blue Boar Lane	„ 10	4			1	210					Yard to 3 houses; pails; fair.
107	Ashleigh Road	„ 10	3			1				211		Detached house (not visited).
108	Grundon Street	„ 11	3			4				212		Old, but clean; open ditch at back.
109	Abbey Street (L.H.)	„ 11	5			3				213, 238	1	Old; low rooms; 5 houses to yard; pails; rooms dirty.
110	Charlotte Street	„ 11	5			2				214		Corner house (inn); fairly well kept.
111	Wand Street	„ 11	2			7				215	8	6 rooms; separate yard; w.c.
112	Emerald Street	„ 11	3			3	240			216		8 houses to yard; street dirty; pails.
113	Moorgate Street	„ 18	7				221, 244, 245, 246, 247, 248.					Well-paved street; house good condition.
114	Mellor Street	„ 20	6			4				224		Separate yard; w.c.; fair state.
115	Hawthorne Street	„ 20	6			2				225		High site; open; w.c.; good condition.
116	Woodgate Terrace	„ 21	3			4				226		12 houses to yard; 2 w.c.'s; fair.
117	High Cross Street	„ 21	10				227					Next door to 131. (House empty at visit.)
118	Cranbourne Street	„ 24	3			3				228		Large gardens to house; w.c.; house clean.
119	Blake Street	„ 24	2				229, 255					Yard to 4 houses; open ashpit; pails; moderate.
120	Leicester Street	„ 25	3			2	230, 253			252, 261		Yard full of pools, &c.; house cleanly.
121	Beatrice Road	„ 26	7				231					About 150 yards from Small-pox Hospital. Clean; good.
122	Gresham Street	„ 27	5			1	272			232		As No. 82 (next door.)
123	Abbey Street	„ 27	5			3				233		Old house; low rooms; dirty (next to 109).
124	Grosvenor Street	„ 27	7			1				234		Butcher's; old house; pails; rooms clean.
125	Denmark Road	„ 27	5				235					Not seen.
126	Wolsey Street	„ 28	7			2				**236**		Yard to 2 houses; w.c.; open ashpit; 6 rooms.
127	Grundon Street	„ 29	2			6				239, 264		Large yard to 4 houses; w.c. and open ashpit at each end; 4 rooms to house; fair.
128	Wright Street	„ 30	7			2	241, 257, 263, 267, 268, 270.			262, 273		10 houses to one passage; garden; 6 rooms; fair.
129	Causeway Lane	„ 31	5				242					2 houses to yard; pails; fair.
130	Burgram Street	June 1	4				243					As No. 87.
131	High Cross Street	„ 7	3			3	249					Baker's shop; cleanly and well kept.
132	Belgrave Gate	„ 7	5			1	250					Butcher's shop; good; clean.
133	Rowan Street	„ 8	1			3				251		Not seen.
134	East Bond Street	„ 10	5			4				254		Greengroccry; new house; shop well kept.
135	Leicester Steeet	„ 11	7			4	256			265		As No. 120.
136	Beatrice Road	„ 12	2		2		259					Very clean; large yard; bakery at back.
137	Syston Street	„ 12	5			1				260		5 rooms; clean; w.c.
138	New Road, Burley's Lane.	„ 13	3			1				266		Small old house; dirty; open ashpit; pails.
139	Beatrice Road	„ 15	6				269					Not seen.
140	All Saints' Road	„ 15	7			2	291			271, 289		Neglected; dirty; canal at back.
141	Beatrice Road	„ 17	3			3				274, 282, **288.**		
142	„ „	„ 17	3				275					As No. 136, &c.
143	Ruby Street	„ 18	3			2	276					
144	Norfolk Street	„ 19	7	1			277					Small villa; 7 rooms; w.c.
145	Ivanhoe Street	„ 19	9				278					6 rooms; well kept; ashpit; w.c. in yard.
146	„ „	„ 19	2			1				279		As 145.
147	„ „	„ 21	5				280					
148	Beatrice Road	„ 22	2			3				281		As 136, &c.
149	„ „	„ 23	2			4	345			283		
150	„ „	„ 23	3		1		284					

* The figures in these columns refer to Table of Cases. Those in leaded type are fatal cases.

TABLE of HOUSES INVADED, with DETAILS as to VACCINATION of their INMATES—*continued.*

Ref. to House List.	Street.	Date of Infection.	Inmates.				Attacked with Small-Pox.				Persons quarantined at Hospital.	Sanitary Condition of House, &c.
			Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.	Vaccinated.	No Information as to Vaccination.	Under Vaccination.	Unvaccinated.		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
151	Raven Street	June 23	5				285					New house; clean.
152	Thornton Lane	„ 26	5				286					4 rooms; pails in yard, &c.
153	Queen Street	„ 28	9				287					Not seen.
154	Ruby Street	„ 30	3			2				290, 299		As No. 76.
155	Great Holme Street	July 2	3				292					Ill-kept; old house; 4 rooms; yard neglected; pails; open ash-pit.
156	Fosse Road	„ 4	3		7	1				293		Detached house (not visited).
157	Grove Road	„ 5	3			5				294		Small yard; 6 rooms, to house; fairly kept.
158	Leamington Street	„ 6	2				295					Yard to 2 houses; w.c.; open ash-pit; fair.
159	Brookhouse Street	„ 6	3		1	1				296		Large; well kept; w.c. in house.
160	Newington Street	„ 8	4				297					Separate yard; 6 rooms; clean; w.c.
161	Ivanhoe Street	„ 9	6				298					As 145.
162	Sylvan Street	„ 22	7			1	300					Good sanitary condition; recently built.
163	„ „	„ 22	3				301					Good sanitary condition; recently built.
164	Newport Street	„ 25	3			2	302			313		As No. 177.
165	Ruby Street	„ 25	5			1	303					As No. 76.
166	Beatrice Road	„ 25	4				304					Yard at back; open w.c.; 6 rooms and bath-room; well kept.
167	Great Holme Street	„ 26	4				305, 310					Builder's yard; clean; sanitary.
168	Beatrice Road	„ 27	6				306					Greengrocery; stabling; w.c.; good.
169	Hinckley Road	„ 28	8				307					Large 12-roomed house; good.
170	Tyndale Street	„ 31	2			1	308					New, and like No. 99.
171	Oban Street	Aug. 1	4			4				309		6 rooms; well kept.
172	Craven Street	„ 10	1			2	312			**311**		5 cottages in row; no back windows; pails; dustbin; unpaved yard.
173	Castle Street	„ 12	3				314					Not seen.
174	Ruby Street	„ 13	6			3				315, **316**		As No. 76.
175	Dorset Street	„ 21	2			3				317		Passage to 2 houses; yard to each; w.c.; ashpit; fairly kept.
176	Court N, Oxford Street.	„ 26	5			2	318, 326, 327.			324, 325		Not seen.
177	Newport Street	„ 30	3		1	1	319			328		Yard; small garden; w.c.; ashpit; new house; fair.
178	„ „	„ 31	4			1				320		Shop and dwelling; new house; fair.
179	North Bridge Place	Sept. 3	4			4				321		Yard to 5 houses (fowls); w.c.; 6 rooms; fair.
180	Dorset Street	„ 6	2			6	332			322, 329		Yard to 2 houses; fairly clean.
181	Diamond Street	„ 11	8			3	323					Neglected; yard dirty; pail system.
182	New Bridge Street	„ 20	3		1		330					Not seen.
183	Underhill Street	„ 21	3			1				331		6 rooms; w.c.; ashpit; fairly kept.
184	Vann Street	Oct. 5	7			2	333					Large garden to 8 houses; w.c.; clean.
185	Frog Island	„ 6	6			3	334			340, 342		New shop; large yard; pails; open ashpit.
186	Grange Lane	„ 9	5			1	335			338		Large drapery; not seen; sanitary arrangements reported good.
187	Gresham Street	„ 10	3			3	336, 344			341		Yard to 4 houses; long passage; fairly kept.
188	Cheapside	„ 14	20				337					Not seen.
189	Court D, Archdeacon Lane	„ 27	1			3				**339**		Five rooms; moderate; pails.
190	Catherine Street	Nov. 16	6				343					Not seen.
191	Southampton Street	„ 21	6			1	345					6 rooms; well kept; w.c.
192	Beatrice Road	„ 21	2			3				347, 353		As others in road.
193	Ruby Street	„ 22	5			4	351			**348**, **352**.		As No. 98.
194	Clarendon Street	„ 27	7				349					Not seen.
195	Beatrice Road	„ 30	4			1	350			354		As others.
196	Ruby Street	Dec. 12	4			4				355		As No. 98.
197	Wand Street	„ 18	5		2	4				356		Well kept; good state.
198	Westbourne Street	„ 20	3			1				357		Six rooms; clean and well kept.
	193 households analysed		841	5	38	350	170	—	4	146		
							15					Cases in 4 other dwellings (including three lodging-houses).
							4			7		Cases arising at Fever Hospital and not removed.
							8	1		1		Cases arising at Workhouse.
							197 (198*)	1	4	154		* One case twice admitted, 60 (1'1).

* The figures in these columns refer to Table of Cases. Those in leaded type are fatal cases.

Note.—Of the 38 here stated to be "under vaccination," 21 were unvaccinated at time of removal of the case. As no further case of small-pox arose in their houses in the subsequent analyses these are included amongst the unvaccinated.

§14. *Analytical Study of the Incidence of Small-pox on the Members of 193 infected Households.*

From the particulars kindly furnished to me of all the persons who were removed to quarantine or were under supervision for 15 days after the occurrence of a case of small-pox in a house, I have extracted the details of 193 such infected households.*

The total number of persons dwelling in these houses is 1,234, of whom 320 were attacked with small-pox. The distribution of the cases of small-pox with reference to the size of the households may be gathered from the subjoined table :—

TABLE XXI.

Households.		Total Inmates.	Cases of Small-pox. Number per Household.								Total.
Size (No. of Inmates).	No. infected.		1.	2.	3.	4.	5.	6.	7.	8.	
2	5	10	4	1	—	—	—	—	—	—	6
3	18	54	15	3	—	—	—	—	—	—	21
4	23	92	19	3	—	1	—	—	—	—	29
5	34	170	21	7	3	2	1	—	—	—	57
6	29	174	17	7	4	1	—	—	—	—	47
7	24	168	13	4	4	—	2	1	—	—	49
8	23	184	14	4	4	—	1	—	—	—	39
9	19	171	11	2	4	—	1	—	—	1	40
10	8	80	5	1	—	1	1	—	—	—	16
11	6	66	5	1	—	—	—	—	—	—	7
13	2	26	1	—	—	—	—	1	—	—	7
19	1	19	1	—	—	—	—	—	—	—	1
20	1	20	1	—	—	—	—	—	—	—	1
—	193	1,234	127	33	19	5	6	2	—	1	320

Sex and Age.—Of these 1,234 individuals, 573 were males and 661 females, whilst of the 320 who were attacked with small-pox, 153 were males and 167 females. The rate of incidence was therefore 26·5 per cent. for the male sex and 25·2 per cent. for the female sex.

The age distribution was as follows :—

TABLE XXII.

—	Attacked with Small-pox.	Not attacked.	Total.
Under 1 year	7	26	33
1 to 5 years	31	95	126
5 „ 10 „	64	138	202
10 „ 15 „	36	135	171
15 „ 20 „	33	116	150
20 „ 30 „	82	132	214
30 „ 40 „	42	96	138
40 „ 50 „	19	104	123
50 „ 60 „	6	45	51
60 „ 70 „	1	14	15
70 and over	—	4	4
Age not ascertained	—	9	9
	320	914	1,234

These may be distributed between age-periods as follows :—

—	Attacked.	Not attacked.	Total.	Attack Rate.
				Per Cent.
Under 1 year	7	26	33	21·2
1 to 10 years	95	233	328	28·9
10 „ 30 „	150	383	533	28·1
30 years and upwards	68	263	331	20·5
Age not ascertained	—	9	9	—
	320	914	1,234	25·9

From Table XXI. it will have been seen that in 127 households, comprising 795 individuals, there was only a single case of small-pox; whilst in 66 households, comprising 439 individuals, more than one case occurred (or 193 in all).

Contrasting these two categories in respect to the ages of the inmates we have :—

Ages of Inmates.	Houses with Single Cases.	Houses with Multiple Cases.
Under 1 year	19 or 2·3 per cent.	14 or 3·2 per cent.
1 to 10 years	196 „ 24·6 „	132 „ 30· „
10 „ 30 „	357 „ 44·9 „	176 „ 40·1 „
30 years and upwards	214 „ 26·9 „	117 „ 26·6 „
Age not ascertained	9 „ 1·2 „	— —
	795	439

These figures show a slight preponderance in the relative number of children in those households in which more than one case of small-pox occurred, as contrasted with those in which only a single case arose.

The difference is still more striking when only those who were attacked are considered.

—	Single.	Multiple.
Under 1 year	2 or 1·5 per cent.	5 or 2·5 per cent.
1 to 10 years	23 „ 18·1	72 „ 37·3 „
10 to 30 „	70 „ 55·1	80 „ 41·4 „
30 years and upwards	32 „ 25·2 „	36 „ 18·6 „
	127	193

It is instructive to note, with reference to the more ready transmission of the disease amongst the young, that a similar preponderance of children attacked with small-pox is to be found in the "multiple series" amongst those who were the first in the household to fall ill. These cases, hereafter termed the "initial" cases, number 80 out of the 193 attacked in those 66 households, and are distributed in age-periods as follows :—

Under 1 year	2 or 2·5 per cent.
1 to 10 years	25 „ 31·2 „
10 to 30 years	42 „ 52·5 „
30 years upwards	11 „ 13·7 „

If any conclusion is permissible from figures so restricted as those it would be that the liability to further infection of a household on the occurrence of small-pox in one of its members, is greater in proportion to the youth of the subject first to be attacked.

Comparison of those attacked and not attacked as regards Vaccination.

Before proceeding to analyse the facts relating to these households more precisely, it may be well to give here the conditions *quâ* vaccination of them dwelling in them, distinguishing those who were attacked with small-pox and those who escaped infection. The statistics will be found in Tables XXIII. and XXIV., which deal with those houses having single and multiple cases respectively. It will be seen that amongst the unvaccinated, a certain proportion were vaccinated as soon as the case was isolated, *i.e.*, after they had been exposed to chances of infection; and where more than one case occurred 4 out of 17 so vaccinated (and who were therefore under vaccination at the time of exposure or of attack) were attacked by the disease.

* I have limited this analysis to the persons dwelling in the houses, but it should be stated that sometimes it was found necessary to quarantine others known to have been in contact with the patient but dwelling apart from him.

Table XXIII.

Single Cases in Houses (127).

—	Attacked.		Not Attacked.				Total.				
	Vaccinated.	Unvaccinated.	Vaccinated.	No information.	Unvaccinated. Vaccinated on removal of Case.	Unvaccinated. Remained.	Vaccinated.	No information.	Unvaccinated. Vaccinated on removal of Case.	Unvaccinated. Remained.	
Under 1 year	—	2	1	—	—	16	1	—	—	18	19
1–5	—	4	12	--	7	49	12	—	7	53	72
5–10	—	19	50	—	10	45	50	—	10	64	124
10–15	6	5	73	—	2	16	79	—	2	23	104
15–20	12	4	75	—	2	7	87	—	2	11	100
20–30	35	8	110	—	—	2	145	—	—	9 8	153
30–40	19	1	56	—	—	4	75	—	—	4 5	80
40–50	7	2	66	4	—	2	74	4	—	4 3	81
50–60	3	—	37	1	—	—	40	1	—	—	41
60–70	—	—	10	—	—	—	10	—	—	—	10
70 and over	—	—	2	—	—	—	2	—	—	—	2
Age?	—	—	9	—	—	—	9	—	—	—	9
	82	45	501	5	21	141	582	5	21	186	795

Table XXIV.

Multiple Cases in Houses (66).

—	Attacked.			Not Attacked.			Total.			
	Vaccinated.	Under Vaccination.	Unvaccinated.	Vaccinated.	Under Vaccination.	Unvaccinated.	Vaccinated.	Under Vaccination.	Unvaccinated.	
Under 1 year	—	1	4	—	1	8	--	2	12	14
1–5	—	1	26	—	2	25	—	3	51	54
5–10	2	1	42	13	4	16	15	5	58	78
10–15	4	—	19	31	4	10	35	4	29	68
15–20	14	1	4	25	2	4	39	3	8	50
20–30	34	—	4	20	—	—	54	—	4	58
30–40	21	—	1	36	—	--	57	—	1	58
40–50	10	—	—	32	—	--	42	—	—	42
50–60	3	—	—	7	—	—	10	—	—	10
60–70	1	—	—	4	—	—	5	—	—	5
70 and over	--	—	--	2	—	--	2	—	—	2
81	89	4	100	170	13	63	259	17	163	439
Total in all Houses	171	4	145	671	5	34 204	842	5	38 349 350	1,234

Influence of Isolation in Limiting Household Infection:—Leaving aside the question of age, the next point of comparison between these two series of infected households to be considered may be to ascertain whether or not the more or less prompt removal to hospital bore any relation to the occurrence of cases after the initial ones had been removed.

Single Cases in Households.

There were 127 houses in which only one case occurred, having a total population of 795, the attack-rate being 16 per cent.

Seven of these cases were treated at their own homes, which contained in all 41 persons, the attack-rate being 17 per cent.

Of the remainder, 120, all of whom were removed to hospital (a case of re-infection was twice admitted, but is not counted twice in this list), came from houses having 754 inmates, the attack-rate being 15·9 per cent.

Single Cases in Households.

A.—List of Households in which one case of Small-pox occurred and was removed to Hospital.

Reference to House List.	Number of Inmates.	Reference to Case List.	Attacked with Small-Pox. Date of Rash.	Date of Removal.	Day of Attack and when Removed.	Remarks.
2	2	2	Sept. 8	Sept. 9	6th.	
5	3	8	Oct. 17	Oct. 21	10th.	
6	5	9	„ 19	„ 20	4th.	
9	3	17	Nov. 4	Nov. 4	3rd.	
10	4	18	„ 5	„ 5	3rd.	
11	5	20	„ 5	„ 9	7th.	
13	11	24	„ 16	„ 18	5th.	
15	3	27	„ 23	„ 24	6th.	
16	8	28	„ 25	„ 26	4th.	
18	10	30	Dec. 4	Dec. 6	5th.	
25	4	42	„ 26	„ 28	5th.	
27	9	46	Jan. 2	Jan. 3	4th.	
30	10	50	„ 5	„ 7	6th.	
31	6	54	„ 6	„ 8	6th.	
34	8	57	„ 6	„ 8	5th.	
35	8	58	„ 6	„ 13	10th.	
36	6	60	„ 7	„ 8	4th.	
		111	„ 30	„ 30	3rd.	
38	8	69	„ 11	„ 13	7th.	
39	4	70	„ 9	„ 10	3rd.	
40	5	71	„ 10	„ 11	4th.	
42	7	73	„ 10	„ 12	4th.	
43	11	74	„ 12	„ 15	7th.	
45	6	76	„ 11	„ 13	5th.	
48	3	83	„ 18	„ 22	7th.	
49	9	86	„ 19	„ 23	7th.	
52	9	97	„ 21	„ 21	2nd.	
53	7	100	„ 24	„ 25	4th.	
54	7	102	„ 24	„ 25	4th.	
55	5	103	„ 24	„ 25	4th.	
56	2	105	„ 25	„ 26	4th.	
57	5	107	„ 28	„ 28	3rd.	
58	6	108	„ 29	Feb. 1	6th.	
60	19	113	Feb. 1	„ 1	4th.	
61	2	115	„ 2	„ 4	5th.	
62	3	116	„ 2	„ 4	5th.	
63	5	120	„ 6	„ 8	6th.	
64	6	117	„ 2	„ 4	5th.	
66	6	127	Feb. 13	Feb. 17	7th.	
72	6	138	March 3	March 6	6th.	
75	10	150	„ 23	„ 23	3rd.	
76	5	157	„ 29	April 3	8th.	
78	7	159	„ 30	„ 1	5th.	
79	4	160	„ 31	March 31	3rd.	
80	3	162	April 4	May 9	38th.	
88	4	176	„ 13	April 14	4th.	
89	6	178	„ 15	„ 16	4th.	
91	9	181	„ 18	„ 19	4th.	
92	3	184	„ 19	„ 21	5th.	
93	5	188	„ 26	„ 28	6th.	
96	4	195	„ 29	May 1	5th.	
99	13	201	May 4	„ 6	5th.	
100	3	202	„ 5	„ 6	4th.	
101	5	203	„ 7	„ 10	6th.	

A.—List of Households, &c.—*continued.*

Reference to House List.	Number of Inmates.	Reference to Case List.	Attacked with Small-Pox. Date of Rash.	Date of Removal.	Day of Attack and when Removed.	Remarks.
102	7	205	May10 -	„ 16 -	9th.	
103	3	206	„ 10 -	„ 15 -	8th.	
105	7	208	„ 12 -	„ 15 -	8th.	
106	5	210	„ 12 -	„ 15 -	6th.	
107	4	211	„ 12 -	„ 13 -	4th.	
108	7	212	„ 13 -	„ 17 -	7th.	
110	7	214	„ 13 -	„ 17 -	7th.	
111	9	215	„ 13 -	„ 15 -	5th.	
114	10	224	„ 22 -	„ 23 -	4th.	
115	8	225	„ 22 -	„ 26 -	7th.	
116	7	226	„ 23 -	„ 29 -	9th.	
117	10	227	„ 23 -	„ 29 -	9th.	
118	6	228	„ 26 -	„ 31 -	8th.	
121	7	231	„ 28 -	June 1 -	7th.	
123	8	233	„ 29 -	„ 2 -	7th.	
124	8	234	„ 29 -	May 31 -	5th.	
125	5	235	„ 29 -	June 2 -	7th.	
126	9	236	„ 30 -	May 31 -	4th.	
129	5	242	June 2 -	June 3 -	4th.	
130	4	243	„ 3 -	„ 6 -	6th.	
131	6	249	„ 9 -	„ 11 -	5th.	
132	6	250	„ 9 -	„ 11 -	5th.	
133	4	251	„ 10 -	„ 12 -	5th.	
134	9	254	„ 12 -	„ 14 -	5th.	
136	4	259	„ 14 -	„ 16 -	5th.	
137	6	260	„ 14 -	„ 15 -	4th.	
138	4	266	„ 15 -	„ 17 -	5th.	
139	6	269	„ 17 -	„ 20 -	6th.	
142	3	275	„ 20 -	„ 20 -	3rd.	
143	5	276	„ 20 -	„ 21 -	4th.	
144	8	277	„ 21 -	„ 25 -	7th.	
145	9	278	„ 21 -	„ 23 -	5th.	
146	3	279	„ 21 -	„ 23 -	5th.	
147	5	280	„ 23 -	„ 25 -	5th.	
148	5	281	„ 24 -	„ 25 -	4th.	
150	4	284	„ 25 -	„ 27 -	5th.	
151	5	285	„ 26 -	„ 30 -	8th.	
152	5	286	„ 28 -	July 1 -	6th.	
153	9	287	„ 30 -	„ 31 -	34th.	
155	3	292	July 4 -	„ 9 -	8th.	
156	11	293	„ 6 -	July 9 -	6th.	
157	8	294	„ 7 -	„ 11 -	7th.	
158	2	295	„ 8 -	„ 10 -	5th.	
160	4	297	„ 10 -	„ 11 -	4th.	
161	6	298	„ 11 -	„ 12 -	4th.	
162	8	300	„ 24 -	„ 26 -	5th.	
163	3	301	„ 24 -	„ 27 -	6th.	
165	6	303	„ 27 -	Aug. 4 -	11th.	
166	4	304	„ 27 -	July 29 -	5th.	
168	6	306	„ 29 -	„ 30 -	4th.	
170	3	308	Aug. 2 -	Aug. 9 -	10th.	
171	8	309	„ 3 -	„ 4 -	4th.	
175	5	317	„ 23 -	„ 24 -	4th.	
178	5	320	Sept. 2 -	Sept. 3 -	4th.	
179	8	321	„ 5 -	„ 6 -	4th.	
181	11	323	„ 13 -	14 -	4th.	

A.—List of Households, &c.—*continued.*

Reference to House List.	Number of Inmates.	Reference to Case List.	Attacked with Small-pox. Date of Rash.	Date of Renewal.	Day of Attack and when Removed.	Remarks.
182	4	330	Sept. 22 -	„ 24 -	5th.	
183	4	331	„ 23 -	„ 26 -	6th.	
184	9	333	Oct. 7 -	Oct. 9 -	5th.	
188	20	337	„ 16 -	„ 18 -	5th.	
189	4	339	„ 29 -	„ 30 -	4th.	
190	6	343	Nov. 18 -	Nov. 21 -	6th.	
191	7	346	„ 23 -	„ 24 -	4th.	
194	7	349	„ 29 -	„ 30 -	4th.	
196	8	355	Dec. 14 -	Dec. 16 -	4th.	
197	11	356	„ 20 -	„ 26 -	9th.	
198	4	357	„ 22 -	„ 24 -	5th.	

B.—Households in which the Case of Small-pox Remained at Home.

Reference to House List.	Number of Inmates.	Reference to Case List.	Attacked with Small-pox. Date of Onset.	Date of Rash.	Day of Attack and when Removed.	Remarks.
37	7	63	Jan. 5 -	?		
44	9	75	„ 9 -	?		
46	5	79	„ 12 -	?		
51	4	95	„ 19 -	?		
159	5	296	July 6 -	?		
169	8	307	„ 28 -	July 30 -		
173	3	314	Aug. -			

Multiple Cases in Households.

More than one case of small-pox occurred in 66 of the households under review, which contained a population of 439 individuals, of whom 193 were attacked with the disease, a rate of nearly 44 per cent.

In considering these cases it is important to distinguish between those who were first to be attacked and those who sickened subsequently. The former are here styled "initial" cases, the rest being termed "later cases." Occasionally it happened that two or more of the inmates fell ill within a few days of one another, being probably infected from the same source, and in that case they would all be regarded as "initial" cases, to which, perhaps, no later ones succeeded. In that case the households concerned would really fall into the same category as those in which only one case occurred, and in dealing with them statistically it will be necessary to transfer them to that category. I have therefore only placed in the category of "later" cases, who may possibly have received infection from the "initial" ones in the same house, those whose illness began on the 12th, or subsequent days of the onset of the initial case. I do not intend to imply that in every case the infection was traceable to the previous one, for this is beyond proof. It is highly probable that this was so in the majority of instances.

Thus, of the 193 cases, 80 may be regarded as being "initial," and 113 as belonging to the group of "later" (and possibly secondary) cases.

As showing the influence of hospital isolation in limiting the spread of the disease in a family, these multiple cases may be divided into two groups, viz.:—

Series A. in which the initial case was removed to hospital, and

Series B., in which the initial cases remained at home.

Series A. comprises 51 households, containing 338 members, of whom 140 were attacked with small-pox; 64 of these may be regarded as "initial" cases, or 19·8 per cent. of all exposed. Subtracting them we have 274 persons, of whom 76, or 27·7 per cent., were subsequently attacked.

Series B. includes 15 households, containing 101 members, of whom 53 were attacked with small-pox; 16 of these may be regarded as "initial" cases, or 15·8 per cent. of the whole number. Subtracting them we have 85

persons, of whom 37, or 43·5 per cent., were subsequently attacked.

According to this the influence of hospital isolation in limiting the spread of the disease in families may be represented as the difference between 27·7 per cent. and 43·5 per cent. of those remaining after the first invasion of the disease in the household.

This, however, requires correction, since in six of these households (Nos. 73, 85, 104, 135, 172, 174) in Series A., the cases were probably infected from a same source, and it cannot be said that any was secondary to a previous case in the house. By eliminating these households comprising 27 individuals, of whom 14 were attacked, the numbers in Series A. were reduced to 45 households, 291 inmates, 50 being attacked in the first instance, and of the 241 remaining 76, or 31·1 per cent., subsequently sickened.

The influence of hospital isolation may then be more correctly stated as between 31·1 per cent. and 43 per cent.

MULTIPLE CASES IN HOUSEHOLDS.

SERIES A.—INITIAL CASES REMOVED TO HOSPITAL.

Ref. to House List.	Number of Inmates.	Initial Cases.				Later Cases.				Remarks.
		Ref. to Case List.	Date of Onset.	Date of Rash.	Day of Removal.	Ref. to Case List.	Date of Onset.	Day of Attack of Initial Case.	Date of Removal.	
3	3	3	Sept. 5	Sept. 7	6th	5	Sept. 27	23rd		
4	6	6	Sept. 28	Oct. 3	6th	7	Oct. 13	16th	Oct. 19	
12	7	23	Nov. 13	Nov. 16	7th	32	Dec. 7	26th	Dec. 10	
14	8	26	Nov. 18	Nov. 21	6th	31	Dec. 4	17th	Dec. 6	
17	7	29	Nov. 29	Dec. 1	5th	36	Dec. 12	14th	Dec. 17	
28	4	47	Dec. 31	Jan. 3	6th	84	Jan. 17	18th	Jan. 19	
29	6	49	Jan. 1	Jan. 5	8th	81	Jan. 15	15th	Jan. 18	
33	4	56	Jan. 4	Jan. 6	4th	89	Jan. 18	15th	Jan. 20	
59	5	110	Jan. 28	Jan. 31	7th	130	Feb. 16	20th	Feb. 18	
65	7	121	Feb. 4	Feb. 7	8th	131	Feb. 16	13th	Feb. 18	
67	7	129	Feb. 12	Feb. 14	5th	136	Feb. 27	16th	March 2	
68	3	133	Feb. 18	Feb. 21	6th	143	March 7	18th	March 10	
70	5	135	Feb. 25	Feb. 27	3rd	155	March 26	20th	March 29	
73	10	139	March 2	March 6	5th					
		140	„ 3	„ 6	4th					
81	6	163	April 3	April 5	7th	185	April 19	17th	April 22	
98	9	199	April 30	May 2	4th	220	May 17	18th	May 20	
109	8	213	May 11	May 13	6th	238	May 29	19th	June 2	
112	6	216	May 11	May 13	6th	240	May 30	20th	June 2	
122	6	232	May 27	May 29	5th	272	June 16	21st	June 19	
127	8	239	May 29	May 31	4th	264	June 13	16th	June 17	
135	11	256	June 11	June 13	3rd					
		265	„ 13	„ 15	4th					
149	6	283	June 23	June 25	5th	345	Nov. 20	—	Nov. 23	No doubt fresh infection
154	5	290	June 30	July 2	40th	299	July 14	15th	Aug. 8	
164	5	302	July 25	July 27	9th	313	Aug. 12	19th	Aug. 15	
167	4	305	July 26	July 28	6th	310	Aug. 9	15th	Aug. 13	
172	3	311	Aug. 10	Aug. 12	5th					
		312	„ 10	„ 12	5th					
174	9	315	Aug. 13	Aug. 15	5th					
		316	„ 16	„ 18	4th					
177	5	319	Aug. 30	Sept. 1	7th	328	Sept. 18	20th	Sept. 21	
192	5	347	Nov. 21	Nov. 23	4th	353	Dec. 6	16th	Dec. 8	

SERIES A.—INITIAL CASES REMOVED TO HOSPITAL—*continued.*

Ref. to House List.	Number of Inmates.	Later Cases.				Initial Cases.				Remarks.
		Ref. to Case List.	Date of Onset.	Date of Rash.	Day of Removal.	Ref. to Case List.	Date of Onset.	Day of Attack of Initial Case.	Date of Removal.	
195	5	350	Nov. 30	Dec. 2	4th	354	Dec. 12	13th	Dec. 14	
19	6	33	Dec. 10	Dec. 16	12th	44	Dec. 31	22nd	Jan. 2	
						59	Jan. 4	26th	„ 6	
41	7	72	Jan. 9	Jan. 11	23rd	104	Jan. 23	15th	Jan. 28	
						126	Feb. 9	32nd	Feb. 11	
50	8	88	Jan. 17	Jan. 19	8th	119	Feb. 2	15th	Feb. 4	
						124	„ 4	17th	„ 6	
77	8	158	March 27	March 29	22ndj	165	April 8	13th	April 12	
						177	„ 12	17th	„ 15	
85	5	167	April 7	April 9	7th					
		169	„ 10	„ 12	4th					
		170	„ 10	„ 12	6th					
90	7	180	April 14	April 16	6th	194	April 26	13th	April 29	
						198	„ 30	17th	May 2	
94	8	191	April 25	April 27	3rd	209	May 10	16th	May 12	
						218	„ 13	19th	„ 15	
97	7	196	April 28	May 1	12th	222	May 19	22nd	May 22	
						223	„ 19	22nd	„ 22	
104	9	207	May 8	May 10	4th					
		217	„ 13	„ 16	4th					
		219	„ 17	„ 20	4th					
140	9	271	June 15	June 17	5th	289	June 29	15th	July 2	
						291	July 2	18th	„ 4	
141	6	274	June 17	June 19	4th	282	June 22	16th	June 24	
						288	„ 29	23rd	July 2	
180	8	322	Sept. 6	Sept. 8	6th	329	Sept. 20	15th	Sept. 22	
						332	„ 21	16th	„ 24	
23	5	40	Dec. 20	Dec. 22	5th	51	Jan. 3	15th	Jan. 5	
						52	„ 3	15th	„ 8	
						92	„ 19	31st	„ 22	
86	6	171	April 10	April 12	7th	189	April 23	14th	April 27	
		172	„ 10	„ 12	7th	193	„ 26	17th	May 2	
120	5	230	May 25	May 27	7th	252	June 8	15th	June 12	
						253	„ 9	16th	„ 12	
						261	„ 12	19th	„ 14	
26	9	45	Dec. 31	Jan. 2	13th	82	Jan. 16	17th	Jan. 18	
		64	Jan. 6	„ 9	7th	85	„ 17	18th	„ 20	
						87	„ 17	18th	„ 19	
32	8	55	Jan. 3	Jan. 5	21st	90	Jan. 18	16th	Jan. 23	
						91	„ 18	16th	„ 23	
						93	„ 19	17th	„ 23	
						101	„ 22	20th	„ 24	
83	7	165	April 4	?	—	190	April 24	21st	April 28	
		173	„ 10	April 12	5th					
		174	„ 10	„ 12	5th					
		179	„ 14	„ 16	4th					

SERIES A.—INITIAL CASES REMOVED TO HOSPITAL—*continued.*

Ref. to House List.	Number of Inmates.	Initial Cases.				Later Cases.				Remarks.
		Ref. to Case List.	Date of Onset.	Date of Rash.	Day of Removal.	Ref. to Case List.	Date of Onset.	Day of Attack of Initial Case.	Date of Removal.	
176	7	318	Aug. 26	Aug. 28	8th	324	Sept. 11	17th	Sept. 14	
						325	„ 11	17th	„ 13	
						326	„ 11	17th	„ 13	
						327	„ 12	18th	„ 14	
20	13	34	Dec. 11	Dec. 13	7th	77	Jan. 10	31st	—	
						114	„ 30	51st	Feb. 4	
						122	Feb. 4	56th	„ 7	
						123	„ 4	56th	„ 7	
						128	„ 12	54th	„ 16	
113	7	221	May 18	May 20	9th	244	June 1	15th	June 6	
						245	„ 2	16th	—	
						246	„ 4	18th	June 6	
						247	„ 4	18th	„ 9	
						248	„ 4	18th	—	

MULTIPLE CASES IN HOUSEHOLDS.

SERIES B.—INITIAL CASES REMAINED AT HOME.

Reference to House List.	Number of Inmates.	Initial Cases.			Later Cases.				Remarks.
		Reference to Case List.	Date of Onset.	Date of Rash.	Reference to Case List.	Date of Onset.	Day of Attack of Initial Case.	Date of Removal to Hospital.	
119	2	229	May 24	?	255	June 10	18th	June 17	
186	6	335	Oct. 9	Oct. 11	338	Oct. 20	12th	Nov. 3	
22	7	39	Dec. 15	Dec. 15	43	Dec. 30	16th	Jan. 2	
					48	Jan. 1	18th	„ 5	
74	6	149	March 19	?	161	April 2	15th	—	Nos. 149 and 156 were not notified.
		156	„ 26						
82	5	164	April 3	April 3	183	April 17	15th	April 20	
					197	„ 29	27th	May 2	
87	5	175	April 10	?	237	May 28	49th	June 1	No. 175 was not notified.
					258	June 11	63rd	„ 13	
185	9	334	Oct. 6	Oct. 8	340	Oct. 28	23rd	Nov. 1	
					342	Nov. 13	39th	„ 16	
187	6	336	Oct. 10	Oct. 12	341	Nov. 2	24th	Nov. 6	
					344	„ 20	42nd	„ 23	
193	9	348	Nov. 22	Nov. 24	351	Dec. 3	12th	Dec. 5	
					352	„ 3	12th	„ 5	
84	10	166	April 5	April 7	182	April 16	12th	April 22	
					186	„ 19	15th	„ 24	
					187	„ 20	16th	„ 22	
21	10	38	Dec. 15	Dec. 17	53	Jan. 3	20th	Jan. 11	
					61	„ 5	22nd	„ 10	
					67	„ 7	24th	„ 11	
					94	„ 19	36th	„ 21	
69	5	134	Feb. 21	Feb. 23	147	March 11	19th	—	These cases were not notified.
					148	„ 13	21st		
					152	„ 22	30th		
					153	„ 22	30th		

SERIES B.—INITIAL CASES REMAINED AT HOME—*continued.*

Reference to House List.	Number of Inmates.	Initial Cases.			Later Cases.				Remarks
		Reference to Case List.	Date of Onset.	Date of Rash.	Reference to Case List.	Date of Onset.	Day of Attack of Initial Case.	Date of Removal to Hospital.	
95	8	192	April 25	?	204	May 6	12th	June 3	No. 192 not notified.
24	4	41	Dec. 23	?	65	Jan. 6	15th	Jan. 25	No. 41 convalescent from a mild and unrecognised attack of small-pox, was removed to hospital with her children on Jan. 25.
					96	„ 20	29th	„ 25	
					98	„ 20	29th	„ 25	
128	9	241	May 30	?	257	June 11	13th	June 15	No. 241 not notified.
					262	„ 13	15th	„ 16	
					263	„ 13	15th	„ 19	
					237	„ 14	16th	„ 19	
					268	„ 14	16th	„ 19	
					270	„ 15	17th	„ 19	
					273	„ 17	19th	„ 19	

TABLE SHOWING THE DAY OF ATTACK UPON WHICH SMALL-POX WERE REMOVED TO HOSPITAL.

—	Group I.	Group II.	
	No. of Cases.	(Initial Cases.) No. of Cases.	Later Cases.
Removed on 2nd day	1	—	—
„ 3rd „	8	2	28
„ 4th „	40	7	24
„ 5th „	36	8	8
„ 6th „	18	10	9
„ 7th „	15	9	2
„ 8th „	6	4	—
„ 9th „	4	2	—
„ 10th „	3	—	—
„ 11th „	1	—	—
„ 12th „	—	2	—
„ 13th „	—	1	—
„ 21st „	—	1	—
„ 22nd „	—	1	—
„ 23rd „	—	1	—
„ 26th „	1	—	1
„ 34th „			
„ 38th „	1	1	—
„ 40th „			
	134	49*	72†

* One of the initial cases in Group II., Series A., was not removed to hospital (No. 165). Three other inmates of the house sickened within six to ten days of the onset of this patient's illness, and are here returned as being also "initial" cases; they were removed to hospital.

† Four cases not removed, Nos. 3, 77, 245, 248.

The reason for the late removal of cases—practically convalescent—lies in the fact that attention was generally not drawn to them until the occurrence of subsequent cases, as the following will show:—

Group I., No. 287.—S. M., f., æt. 47., admitted on July 31st, the 34th day of her illness, which was unaccompanied by any marked constitutional disturbance; but two days after its commencement she was attacked by a profuse eruption, which was still well marked when admitted. There was no history of contact with a previous case; and the course and character of the rash was so anomalous that it was very doubtfully regarded as variolous. She was not put into the small-pox ward. She was said to have been re-vaccinated in 1871.

No. 162.—J. H., m., æt. 39, admitted on May 9th, the 38th day of his illness, presenting characteristic scabs of variola pustules. He had not been attended by a medical man; but a fortnight after he was taken ill his child sickened, and died on April 23rd, the cause of death being certified as "convulsions."

Group II., No. 33.—W. G. S., æt. 13, unvaccinated, a confluent attack, but not seen by medical officer until maturation was setting in. He at once removed the child to hospital, the 12th day of his illness. Two other cases arose in this house, viz., No. 44, who sickened on the 22nd day of the invasion in the first case, and was therefore probably infected about four days before No. 33's removal, and No. 59 who sickened four days later, and who may have been infected the same day that No. 33 was removed.

No. 196, B. S., f., æt. 2, unvaccinated, admitted May 9th, the 12th day of illness, having contracted the disease apparently from her father, who lives at T——, a village near Leicester. The child when taken ill was sent to its grandmother's in Leicester, where the case was discovered. Two other children subsequently sickened, Nos. 222 and 223, both on the 22nd day of the illness of No. 196, and were therefore probably infected four days before her removal to hospital.

No. 45, N. H., f., æt. 12, unvaccinated, had a very mild attack, the eruption fading when she was admitted on the 13th day of her illness. Six days after her illness began, her sister, F. H., æt. 14 (No. 64), sickened, and was taken into hospital the same day as No. 45, viz., January 12th, her attack being a severe and unmistakeable one. Three other children of this family subsequently sickened (viz., Nos. 82, 85, 87), three and four days after the removal of No. 45, by whom they had probably been infected about the 4th or 5th day of her illness.

No. 55, F. J., m., æt. 10, unvaccinated, had a discrete attack, which passed unrecognised until other cases arose in the house. He was admitted on the 21st day of attack, the four others (90, 91, 93, and 101) all falling ill within this period of his illness.

No. 158, H. B., f., æt. 21, vaccinated, was another case which had passed unrecognised, and was not discovered until inquiries were being made about a series of persons who had also mostly had mild unrecognised attacks. No. 158 had recovered from the eruption which had been sparsely distributed over the face and arms, when admitted on the 22nd day.

No. 72, J. J. J., m., æt. 8, unvaccinated, was taken into quarantine when his sister C. J. (No. 104) was admitted into the small-pox ward. It then became evident from the stains and marks on his limbs and face that he had recently passed through an attack himself, and was probably the source of the infection of No. 104 and No. 126.

No. 290, E. C., f., æt. 8 months, unvaccinated, passed through a severe attack without having any medical attendance, and about 14 days after she was attacked her brother, W. A. C., æt. 3, unvaccinated (No. 299), also sickened and had a confluent attack. Although neither was admitted until late in the disease, No. 299 on the 26th day, and No. 290 on the 40th day (both showing marked pitting and traces of eruption), no other members of the household suffered. They were only three in number, aged 5, 30, and 34 years respectively, and were all vaccinated.

To the foregoing 10 cases of unavoidable delay in admission to hospital may be added the following cases of mild small-pox which were not under medical treatment, and were detected by the sanitary authority.

In Group I., No. 303 was discovered in a house-to-house inspection of the district, a week after the rash appeared. She was removed to hospital on the 11th day.

No. 58 was also first seen after the rash had been out for a week, and was removed on the 10th day.

No. 227 admitted on 9th day.

No. 205 admitted on 9th day.

No. 292 discovered at home, not having medical advice; was admitted on the 8th day.

In Group II., No. 221, a dressmaker, who may have been infected through a visit of a nurse at the small-pox hospital, was admitted on the 9th day, and five other members of the family infected during the first days of her illness, also had sparse eruptions.

Deducting these 16 cases there remain for comparison in Group I., 127 cases; in Group II., 41 initial and 71 later cases.

In Group I., 85, or 67 per cent., were removed on the 5th day or earlier.

In Group I., 42, or 33 per cent., were removed on the 6th to 10th day.

In Group II., initial cases, 17, or 41·4 per cent., on 5th day or earlier.

In Group II., initial cases, 24, or 58·5 per cent., 6th to 9th day.

In Group II., later cases, 60, or 84·5 per cent., on 5th day or earlier.

In Group II., later cases, 11, or 15·5 per cent., on 6th and 7th days.

This computation clearly shows, as might have been anticipated, that promptitude in hospital isolation is a potent safeguard to the remaining members of a family. For Group I. is composed of households in which no case were traceable to infection from the first to be attacked; while two-thirds of the cases were removed by the 5th day of attack; whereas in Group II., households in which cases arose subsequent to and probably infected by the first cases, only two-fifths of these initial cases were removed by the 5th day. It also shows how large a proportion can be removed in these early days when the invaded households are under observation, more than four-fifths of the later cases in this group being thus early isolated.

Quarantine of Members of Infected Households.

Dealing with the 193 households which have been here analysed, it is found that from 45 of them, containing in all 314 individuals, there were sent into quarantine at the hospital when the case (or cases) of small-pox was removed—211 of the unaffected inmates together with 24 other persons known to have been in contact with the patient. Of this number (211) 15 or 7·1 per cent. were attacked during the period of quarantine, whilst 4 others or 1·9 per cent. developed small-pox from 6 to 12 days after returning to their homes, the inference being that they must have been infected whilst in quarantine.

The system of quarantining was in operation from the beginning of the outbreak until May.

	Total of Invaded Houses.	Houses whence Inmates sent to Quarantine.	Households from which Members sent to Quarantine.						Total Number in Households sent to Quarantine.	Total Inmates of all Invaded Houses.
			Initial Cases of Small-pox.	Sent to Quarantine.	Later Cases of Small-pox.			Remained at Home.		
					Arising before Quarantine.	During Quarantine.	After Quarantine.			
September 1892 -	3	3	3	8	—	1	1	—	11	11
October „ -	2	2	2	6	—	—	—	—	8	8
November „ -	9	7	7	38	—	1	1	—	45	56
December „ -	11	6	7	29	2	7	1	5	43	81
January 1893 -	34	14	14	78	5	4	—	6	103	225
February „ -	7	4	4	19	—	1	1	—	23	38
March „ -	8	1	1	5	2	—	—	2	10	56
April „ -	19	4	9	9	1	1	—	3	22	117
May „ -	31	4	4	19	1	—	—	6	30	213
	124	45	51	211	11	15	4	22	295	805

It is apparent from these figures that the system of removal to quarantine of those dwelling in infected houses was only partially carried out during the months it was in operation. The alternative method, that, namely, of keeping infected households and persons known to have been exposed to infection under supervision by the sanitary officials for the quarantine period, was carried out in the remainder, and in all those which occurred after the month of May. It is impossible to secure data which would enable me to judge of the comparative efficiency of these two systems. In theory, the isolation of an infected family for 15 days should prevent the spread of the disease beyond its limits: and it might be thought that this isolation was far more certainly secured by removal of the family to a special quarantine building. On the other hand, when, as was the case at Leicester, the quarantine building is contiguous to that used for the reception of those attacked with the disease, there must be some risk of infection of those quarantined, or of their transference of contagion to others on leaving quarantine. These considerations, besides the fact that both plans were in operation together, make it very difficult to institute a comparison between them.

	Houses: Number Invaded.	Number of Inmates.	Attacked with Small-pox.		Sent to Quarantine.	Remained at Home.
			Initial Cases.	Later Cases.		
September 1892 - - -	3	11	3	2	8	—
October „ - - -	2	8	2	—	6	—
November „ - - -	9	56	9	3	38	8
December „ - - -	11	81	12	23	29	40
January 1893 - - -	34	225	34	11	78	113
February „ - - -	7	38	7	8	19	12
March „ - - -	8	56	10	3	5	41
April „ - - -	19	117	25	19	9	83
May „ - - -	31	213	33	20	19	161
June „ - - -	25	147	26	6	—	121
July „ - - -	16	86	16	2	—	70
August „ - - -	8	45	10	5	—	35
September „ - - -	5	35	5	2	—	30
October „ - - -	6	54	6	5	—	48
November „ - - -	6	39	6	4	—	33
December „ - - -	3	23	3	—	—	20
	193	1,234	207	113	211	815

So far as the information at my disposal goes I have reasonable ground for the belief that in 19 groups containing in all 52 houses, there was infection from house to house. In 12 of these groups only two houses are concerned, viz.: Nos. 19 and 38; 20 and 70; 21 and 37; 22 and 34; 25 and 36; 32 and 41; 90 and 104; 108 and 127; 109 and 123; 113 and 132; 117 and 131; 176 and 183. The total number of inmates of these 24 houses amounted to 176, of whom 54 were attacked with small-pox, 39 of the cases arising in the 12 houses first invaded and 15 in the 12

invaded secondarily. Again, of this group, the inmates of five houses first to be attacked (Nos. 19, 22, 25, 32, and 109) were quarantined at the hospital, the number of cases of small-pox in these houses amounting to 15, whilst 7 cases occurred in the five houses secondarily invaded, the inmates of three of which were removed to quarantine.

In three groups there were three houses invaded, viz.: Nos. 5, 6, and 10; 80, 94, and 100; 97, 105, and 114. The inmates of these nine houses numbered 50, of whom 13 were attacked with small-pox, five in the houses first invaded, and eight in those invaded secondarily. Of these groups, the inmates of two houses first infected (Nos. 5 and 80) were removed to quarantine at the hospital, there being only one case in each house, and six in the four others secondarily invaded, the inmates of two of which were also removed to quarantine.

In two groups there were four houses, invaded, viz: Nos. 35, 49, 53, and 54; 84, 99, 101, and 106. The inmates of these eight houses amounted to 64, of whom 17 were attacked with small-pox, five arising in the two houses first invaded, and 12 in the six others. In neither instance were the inmates of the house first invaded removed to quarantine, but those of three of the secondarily invaded houses were so dealt with.

There is one group of five invaded houses, viz.: Nos. 87, 95, 120, 130, and 135, numbering 33 inmates, of whom 12 were attacked with small-pox and none removed to quarantine; three of the cases arose in the first house.

There is also one group of six such invaded houses, viz.: Nos. 69, 74, 77, 82, 83, and 86, comprising 36 inmates, of whom 22 were attacked with small-pox, five cases arising in the first invaded house. The members of two of the secondarily infected houses were removed to quarantine at the hospital.

Thus inmates of seven houses were removed to quarantine on the occurrence of small-pox in the house, but not until 9 other families had been more or less directly infected by them. The total number of inmates of these houses was 96, of whom 30 were attacked with small-pox, 17 of those cases occurring in the seven households first invaded.

Per contra, the inmates of 12 invaded households remained at home, and 24 other families were more or less directly infected by them. The total number of inmates of these houses was 263, of whom 88 were attacked with small-pox, 42 of these cases arising in the 12 houses first invaded.

In order to attempt a just comparison it will be necessary to subtract from the latter all those households in which cases occurred unknown to the authorities, until, perhaps, on making inquiry into the origin of other cases those were revealed.

In the case of those households primarily infected, whose members were removed to quarantine at the same time as the case of small-pox was removed to hospital, it will be seen from the subjoined analysis, that such removal took place at periods varying from 4 to 37 days subsequent to the first appearance of small-pox in the house, and that in only two instances, viz., in one where such removal occurred on the 10th day, the other where it occurred on the 38th day, was more than one other household secondarily infected.

In the case of those households primarily infected, whose members were not removed to quarantine, it will be observed that in one instance, where five persons were attacked in the house, not one of which was notified—there were five other houses secondarily infected. In three other instances—the first case arising in the primarily infected houses was not removed (owing to non-notification) and the fact of such houses being infected was not known to the authorities until periods ranging from 17 to 52 days after the first appearance of small-pox in the house. It is not surprising therefore to find that eight other households were infected from these. However, it appears that in one instance (No. 21) small-pox appeared in the house secondarily infected after the removal of two of the cases in the first house; in another (No. 84), after all the cases had been removed from the first house, small-pox appeared in the three houses secondarily infected; and in the third (No. 87) no case had been removed from the first house before the disease made its appearance in the four other houses secondarily attacked. Of the remainder, 8 houses, the cases first arising were removed to hospital at periods ranging from 5 to 11 days after the onset of symptoms. There were 11 households secondarily infected from them, 5 of which were in connexion with those in which removal took place on the 10th and 12th days of attack respectively. In each of these instances the first case arising had been removed prior to the appearance of small-pox in other households.

HOUSE-TO-HOUSE INFECTION.

Reference.	Households Primarily infected.			Households Secondarily infected.	
	Day of Attack of Initial Case on which Quarantine established.	Number of Cases arising—		Number.	Cases therein.
		Before Quarantine.	During Quarantine.		
No. 25	5th day	1	—	1	1
,, 109	6th ,,	1	1	1	1
,, 5	10th ,,	1	—	2	2
,, 19	12th ,,	1	2	1	1
,, 22	16th ,,	2	1	1	1
,, 32	24th ,,	6	—	1	3
,, 80	38th ,,	1	—	2	4
7 houses.		13	4	9 houses.	13

Reference.	Households primarily infected.		Of other Cases	Houses secondarily infected.	
	Number of Cases in Household.	Day of Removal of First Case.		Number.	Cases therein.
No. 90	3	6th day	16th and 19th	1	3
,, 20	6	7th ,,	51st to 56th (one not removed).	1	2
,, 108	1	7th ,,	—	1	2
,, 176	5	8th ,,	19th and 20th	1	1
,, 113	6	9th ,,	20th and 23rd (two not removed).	1	1
,, 117	1	9th ,,	—	1	1
,, 35	1	10th ,,	—	3	3
,, 97	3	12th ,,	25th	2	2
,, 84	4	Not removed	18th and 20th	3	3
,, 21	5	,,	28th to 30th	1	1
,, 87	3	,,	53rd and 65th	4	9
,, 69	5	,,	Not removed.	5	17
12 houses.	43			24	45

The removal to quarantine, which coincided with the removal of the case of small-pox (in a few instances this was not the first case arising in the house), took place at the following periods of the invasion of the household by the disease:—

In	1	house,	family	removed to quarantine	on 2nd day.
,,	4	,,	,,	,,	3rd ,,
,,	7	,,	,,	,,	4th ,,
,,	9	,,	,,	,,	5th ,,
,,	7	,,	,,	,,	6th ,,
,,	7	,,	,,	,,	7th ,,
,,	2	,,	,,	,,	8th ,,
,,	1	,,	,,	,,	10th ,,
,,	1	,,	,,	,,	12th ,,
,,	1	,,	,,	,,	13th ,,
,,	1	,,	,,	,,	19th ,,
,,	1	,,	,,	,,	21st ,,
,,	1	,,	,,	,,	22nd ,,
,,	1	,,	,,	,,	23rd ,,
,,	1	,,	,,	,,	38th ,,
	45				

The period of quarantine during which the 15 cases arising therein developed was, on 4th day, 1 case; 5th day, 2 cases; 7th day, 1 case; 9th day, 2 cases; 10th day, 6 cases; 11th day, 1 case; 13th day, 1 case; 14th day, 1 case; whilst of the 4 persons who were taken ill after leaving quarantine, they sickened on 6 (?), 7, 8, and 12 days from that date respectively.

Hospital Quarantine.

Month.	Reference to House List.	No. of Inmates.	Cases arising at Home.*	Numbers sent into Quarantine.	Attacked in Quarantine.	Day of stay in Quarantine.	Attacked after Quarantine.
Sept. 1892	3	3	No. 3	2	—	—	No. 5.—8 days after.
,, ,,	4	6	No. 6	5	No. 7	10th	
Nov. ,,	12	7	No. 23	5	—	—	No. 32.—? 6 days after.
,, ,,	14	8	No. 26	7	No. 31	11th	
Dec. ,,	19	6	No. 33	5	No. 44	10th	
					No. 59	14th	
,, ,,	22	7	Nos. 39, 43, 48	1			
	23	5	No. 40	4	No. 51	10th	No. 92.—7 days after.
					No. 52	10th	
	26	9	Nos. 45, 64	7	No. 82	4th	
					No. 85	5th	
					No. 86	5th	
Jan. 1893	32	8	Nos. 55, 90, 91, 93, 101	3			
	41	7	Nos. 72, 104	5	No. 132	9th	
	50	8	No. 88	7	No. 119	7th	
					No. 124	9th	
	59	5	No. 110	4	No. 130	13th	
Feb. ,,	67	7	No. 129	6	No. 136	10th	
	70	5	No. 135	4	—	—	No. 155.—? 12 days after.
March ,,	77	8	Nos. 158, 165, 177	5			
April ,,	81	6	No. 163	5	No. 185	10th	
,, ,,	83	7	Nos. 165, 173, 174, 179, 190.	1			
,, ,,	85	5	Nos. 167, 169, 170	2			
May . ,,	109	8	Nos. 213, 238	1			
	19 houses	125	36	79	15	—	4

Of the 36 cases arising "at home" 25 were "initial," 11 "later" cases.

In the analysis of the facts regarding the incidence of small-pox upon the 193 households under review—it will be more appropriate to separate them into two main groups—differing slightly from those above given, according as to whether or not cases occurred in the house after an interval sufficient to justify the inference that the later arising cases may have acquired the disease from the initial case. It must, of course, be conceded that such a division is somewhat arbitrary and hypothetical, but in the main it is likely to be accurate; and may enable some useful comparisons to be made.

Group I.—This group comprises all those households in which there is no sufficient evidence that any secondary infection arose in the house from the first to be attacked. It will include the 127 houses in which a single case of small-pox only occurred, and six in which there was more than one case.

Group II.—This group comprises those households in which there is every probability that the cases arising subsequently to the first infected by it.* It will include 60 households.

* There is only one exception to this where apparently re-infection of a household occurred, viz.:—No. 149.

—	Group I. (133 Households.)	Group II. (60 Households.)	
		Initial.	Later.
Attacked with small-pox -	141	66	113
Not attacked - - -	701	213	
Total - - -	842	392	

These groups may be again sub-divided, as before, into series A and B, according as to whether the "initial" case was removed to hospital or remained at home. The latter series (B) contains all those cases which were not notified, and which passed unrecognised, until the subsequent illness of other members of the household led to their discovery.

—	Group I.		Group II.	
	Series A.	Series B.	Series A.	Series B.
Attacked - -	134	7	Initial - 50	16
Not attacked -	676	34	Later - 67	37
			165	48
	801	41	291	101

The attack rates in each series are therefore :—

Group I. (all cases) - - -	17·9	per cent.
A. Initial case removed - -	16·7	,,
A. ,, ,, remained - -	17·	,,
Group II. (later cases only, exclusive of initial cases) - - -	34·3	,,
A. Initial case removed - -	31·5	,,
B. ,, ,, remained - -	43·5	,,

The tables already given (XXIII. and XXIV.) which showedthe age-distribution and state as to vaccination of the inmates of houses yielding single and multiple cases respectively, require but slight modification to be adapted to the two groups here dealt with, owing to the transference to Group I. of six households in which more than one case occurred. The annexed Tables XXV. and XXVI. give the modified statistics, which are utilised in the subsequent analysis.

Table XXV.

Group I. (133 houses).

Houses with single cases, 127 ; with multiple cases, 6.

—	Attacked.			Not Attacked.					All Inmates.				
	Vaccinated.	Under Vaccination.	Unvaccinated.	Vaccinated.	No Information.	Under Vaccination.	Unvaccinated. Vaccinated on Removal of Case.	Unvaccinated. Remained.	Vaccinated.	No Information.	Under Vaccination.	Unvaccinated. Vaccinated on Removal of Case.	Unvaccinated. Remained.
Under 1 year	—	—	3	1	—	—	—	16	1	—	—	—	19
1 to 5 years	—	—	5	12	—	1	7	52	12	—	1	7	57
5 to 10 ,,	—	—	20	53	—	—	10	47	53	—		10	67
10 to 15 ,,	6	—	9	73	—	2	2	16	81	—	2	2	25
15 to 20 ,,	13	1	4	80	—	1	2	7	93	—	2	2	11
20 to 30 ,,	42	—	6	114	—	—	—	2	156	—	—	—	8
30 to 40 ,,	21	—	1	60	—	—	—	4	81	—	—	—	5
40 to 50 ,,	7	—	2	70	4	—	—	2	77	4	—	—	4
50 to 60 ,,	3	—	—	38	1	—	—	—	41	1	—	—	—
60 to 70 ,,	—	—	—	10	—	—	—	—	10	—	—	—	—
70 and ever	—	—	—	2	—	—	—	—	2	—	—	—	—
Age not ascertained.	—	—	—	9	—	—	—	—	9	—	—	—	—
	91	1	49	525	5	4	21	146	616	5	5	21	195

Table XXVI.

Group II. (60 houses).

—	Attacked.			Not Attacked.			All Inmates.		
	Vaccinated.	Under Vaccination.	Unvaccinated.	Vaccinated.	Under Vaccination.	Unvaccinated.	Vaccinated.	Under Vaccination.	Unvaccinated.
Under 1 year -	—	1	3	—	1	8	—	2	11
1 to 5 years -	—	1	25	—	1	22	—	2	47
5 to 10 ,, -	2	1	41	10	4	14	12	5	55
10 to 15 ,, -	3	—	19	26	2	10	29	2	29
15 to 20 ,, -	13	—	4	20	1	4	33	1	8
20 to 30 ,, -	28	—	4	18	—	—	46	—	4
30 to 40 ,, -	19	—	1	32	—	—	51	—	1
40 to 50 ,, -	10	—	—	28	—	—	38	—	—
50 to 60 ,, -	3	—	—	6	—	—	9	—	—
60 to 70 ,, -	1	—	—	4	—	—	5	—	—
70 and over -	—	—	—	2	—	—	2	—	—
	79	3	97	146	9	58	225	12	155

The above data are diagrammatically illustrated in Charts VI. and VII., which show the relative incidence of the disease in each vaccination class and at each age-period. Thus, of the 1,234 persons, 320 of whom were attacked with small-pox, 841 were vaccinated, of whom 170 were attacked, a rate of 20·2 per cent. ; whereas 371 were unvaccinated, of whom 146 were attacked, a rate of 39·2 per cent.

Of the *vaccinated*, at ages 0 to 10 years, 78, of whom 2 attacked ; a rate of 2·5 per cent.

10 to 30 years, 438, of whom 104 attacked ; a rate of 23·7 per cent.

30 years and over, 316, of whom 64 attacked ; a rate of 20·2 per cent.

And of the *unvaccinated*, at ages 0 to 10 years, 273 of whom 97 attacked ; a rate of 35·5 per cent.

At ages 10 to 30 years, 88, of whom 45 attacked ; a rate of 51·5 per cent.

At ages 30 years and over, 10, of whom 4 attacked ; a rate of 40 per cent.

These figures require to be slightly modified by the inclusion of reference to these who are stated to have had small-pox prior to this outbreak. There were in all 19 such persons,* 12 of whom were vaccinated, and none of whom suffered from small-pox on this occasion. Eliminating, the rate amongst the vaccinated would be raised to 20·5 per cent and amongst the unvaccinated to 39·8 per cent. ; and as they all were individuals above the age of 30 years, the attack rates in this age-period would be raised to vaccinated, 21·5 per cent. unvaccinated, 80 per cent.

It will also be seen (Table XXVII.) that of 115 persons known to have been re-vaccinated, 6 were attacked with small-pox—a rate of 5·2 per cent. The dates of their re vaccination were from 2 to 30 years previously.

In the remaining tables which have been compiled, the general statistics are sub-divided first, amongst the Groups I and II., already defined, and secondly, with reference to the fact whether in each group the initial cases arising in the houses were removed to hospital (A) or remained at home (B.)

Table XXVII.

Vaccination Data of Members of 193 Invaded Households.

—	Attacked.	Not attacked.	—
Vaccinated - - - -	170	671	841
Re-vaccinated - - -	6	109	—
Previous small-pox - - -	—	12	—
Under Vaccination - - -	4	13	17
No information - - -	—	5	5
Previous small-pox - - -	—	2	—
Unvaccinated — Vaccinated on removal of case.	—	21	225 371
Unvaccinated — Remained unvaccinated.	146	204	
Previous small-pox - - -	—	5	—
	320	914	1,234

Separating these into the two groups above defined, it is seen (Table XXVIII.) that in *Group I., i.e.*, households in which no case occurred subsequent to the first attacked, the incidence on the *vaccinated* members was 14·6 per cent. ; on the *unvaccinated* 23·0 per cent. If those who had previously had small-pox be subtracted, these rates would be 14·7 per cent. and 23·5 per cent. respectively.

In Group II. where cases arose subsequent to the "initial" ones, the incidence of the *later* arising cases, amongst the *vaccinated* members, was 25·8 per cent. (or 27 per cent. if those previously having had small-pox be excluded) ; and amongst the *unvaccinated* members it was 46·4 per cent.

But if all the cases (initial and later) be reckoned, the rates of incidence in Group II. amount to 35·4 per cent. for the vaccinated, and 62·3 per cent. for the unvaccinated class.

* I have not included case No. 60 who was apparently re-infected (*v. ante*). If this case was reckoned it would raise the total numbers to 240 and 321 respectively—as there were five other inmates of her house who would have to be reckoned twice over.

TABLE XXVIII.

—	Group I. 133 Households.			Group II. 60 Households.				—
				Attacked.				
	Attacked.	Not Attacked.	Total.	Initial.	Later.	Not attacked.	Total.	
Vaccinated	90	525	615	29	51	146	226	841
Re-vaccinated	1	83	—	1	4	26	—	—
Previous small-pox	—	4	—	—	—	8	—	—
Under vaccination	1	4	5	—	3	9	12	17
No information	—	5	5	—	—	—	—	5
Previous small-pox	—	2	—	—	—	—	—	—
Unvaccinated:—								
Vaccinated on removal of case.	—	21	217	37	59	58	154	371
Remained unvaccinated.	50	146						
Previous small-pox	—	5	—	—	—	—	—	—
	141	701	842	66	113	213	392	1,234

In Tables XXIX. and XXX. the same figures as these given in Table XXVIII. are distributed amongst four age-periods, so that it is possible to calculate the incidence of the disease, *i.e.*, the attack-rates amongst the vaccinated and unvaccinated members of each of those communities at different periods of life.

Thus, in Group I., it will be seen that *under the age of one year* there was one *vaccinated* infant who did not have the disease; and 19 *unvaccinated*, three of whom were attacked, *i.e.*, an incidence of 15·8 per cent. (*nearly*). At age one to ten years there were 65 children who were *vaccinated*, none of whom were attacked by small-pox; and 141 *unvaccinated* of whom 25 were attacked, an incidence of 17·7 per cent. At ages 10 to 30 years the *vaccinated* were 329 in in number, and 59 were attacked, an incidence of 18·1 per cent; the *unvaccinated* were 43, of whom 17 were attacked, an incidence of ~~39·5~~ per cent. Lastly, at ages 30 years and over, of 211 who were *vaccinated*, 31 were attacked, an incidence of 14·6 per cent. (or nearly 15 per cent., if those who previously had had small-pox be subtracted); and of ~~nine~~ who were *unvaccinated*, ~~three~~ were attacked, an incidence of ~~33·3~~ per cent. (which is raised to ~~66·6~~ per cent. if those who previously had had small-pox be subtracted).

The rates are, of course, larger in Group II., where the number of cases is proportionately higher. Thus, taking all the cases (Table XXX.), it is seen that under one year of age there were 11 *unvaccinated*, of whom three were attacked, an incidence of 27·2 per cent. At one to ten years, 12 were *vaccinated*, two attacked, an incidence of 16·6 per cent., and 102 *unvaccinated*, 66 attacked, an incidence of 64·7 per cent. At 10 to 30 years 108 were *vaccinated*, of whom 45 were attacked, an incidence of 40·7 per cent.; 45 were *unvaccinated*, 25 attacked, an incidence of 65·8 per cent. At 30 years and over, 105 were *vaccinated*, 33 attacked, an incidence of 31·4 per cent. (raised to 34 per cent. on subtracting those who had previously had small-pox). There was one *unvaccinated* subject who was attacked.

Explanation of Chart VII.:—

This chart is intended to illustrate the condition as to vaccination of 1,234 *members of* 193 *households invaded by small-pox. Each square represents one individual—the shaded squares being those who were attacked with small-pox, the open squares those who were not attacked. A previous attack of small-pox is indicated by the sign* ⊙. *The fatal cases are indicated thus* +. *The chart shows that of the total number—*1,234 *persons—*320 *were attacked with small-pox, of whom* 17 *died. Of these numbers there were:—*

Vaccinated, 841: *attacked*, 170; *not attacked*, 671; *died*, 1.
No information as to vaccination, 5: *none of whom were attacked.*
Under vaccination, 17: *attacked*, 4; *not attacked*, 13.

Unvaccinated:—

(*a.*) *Vaccinated on removal of previous case*, 21: *none of whom attacked.*
(*b.*) *Not vaccinated*, 350: *attacked*, 146; *not attacked*, 204; *died*, 16.

A previous attack of small-pox was alleged in 12 *of the vaccinated; 2 of those in whom no information as to vaccination was obtained; and in 5 of the unvaccinated.*

TABLE XXIX.

GROUP I.—133 houses with 842 inmates, of whom 141 attacked.

—	Under 1 year.		1 to 10 years.		10 to 30 years.		30 years and upwards.		Age not ascertained.		All Ages.	
	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.
Vaccinated	—	1	—	65	~~80~~ 59	270	31	180	—	9	90	525
Re-vaccinated	—	—	—	2	1	—	1	37	—	9	1	83
Previous small-pox.	—	—	—	—	—	—	—	4	—	—	—	4
No information on vaccination.	—	—	—	—	—	—	—	5	—	—	—	5
Previous small-pox.	—	—	—	—	—	—	—	2	—	—	—	2
Under vaccination.	—	—	—	1	1	3	—	—	—	—	1	4
Unvaccinated:—												
Vaccinated at once.	—	—	—	17	—	4	—	—	—	—	—	21
Not vaccinated	3	16	25	99	~~18~~ 20	25	~~2~~ 3	6	—	—	~~49~~ 50	146
Previous small-pox.	—	—	—	—	—	—	—	5	—	—	—	5
	3	17	25	182	~~79~~ 80	302	~~34~~ 36	191	—	9	141	701

Total re-vaccinated, 84, 1 of whom attacked by small-pox.
Total who had had small-pox previously, 11.

TABLE XXX.

GROUP II.—60 houses with 392 inmates, of whom 179 attacked.

—	Under 1 year.		1 to 10 years.		10 to 30 years.		30 years and upwards.		All Ages.	
	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.
Vaccinated	—	—	2	10	44	64	33	72	79	146
Re-vaccinated	—	—	—	2	2	10	3	14	5	26
Previous small-pox	—	—	—	—	—	—	—	8	—	8
Under vaccination	1	1	2	5	—	3	—	—	3	9
Unvaccinated	3	8	66	36	27	14	1	—	97	58
	4	9	70	51	71	81	34	72	179	213

Total re-vaccinated, 31, 5 of whom attacked by small-pox.
Total who had had small-pox previously, 8.

Vaccination and Measures of Isolation.

In order to determine whether any appreciable influence was exerted upon the incidence of the disease by removal of the initial cases to hospital, the cases have been distributed into two series, some of which fall under each of the groups above considered. Series A. comprises those households from which the initial cases were removed to hospital; Series B. those in which such cases remained at home. The first group contains 1,092 members—260 of whom were attacked by small-pox; the second, 142 of whom 60 were attacked.

Explanation of Chart VIII.:—

This chart deals with the same statistics as Chart VI., except that the 1,234 *persons are grouped in age-periods.*

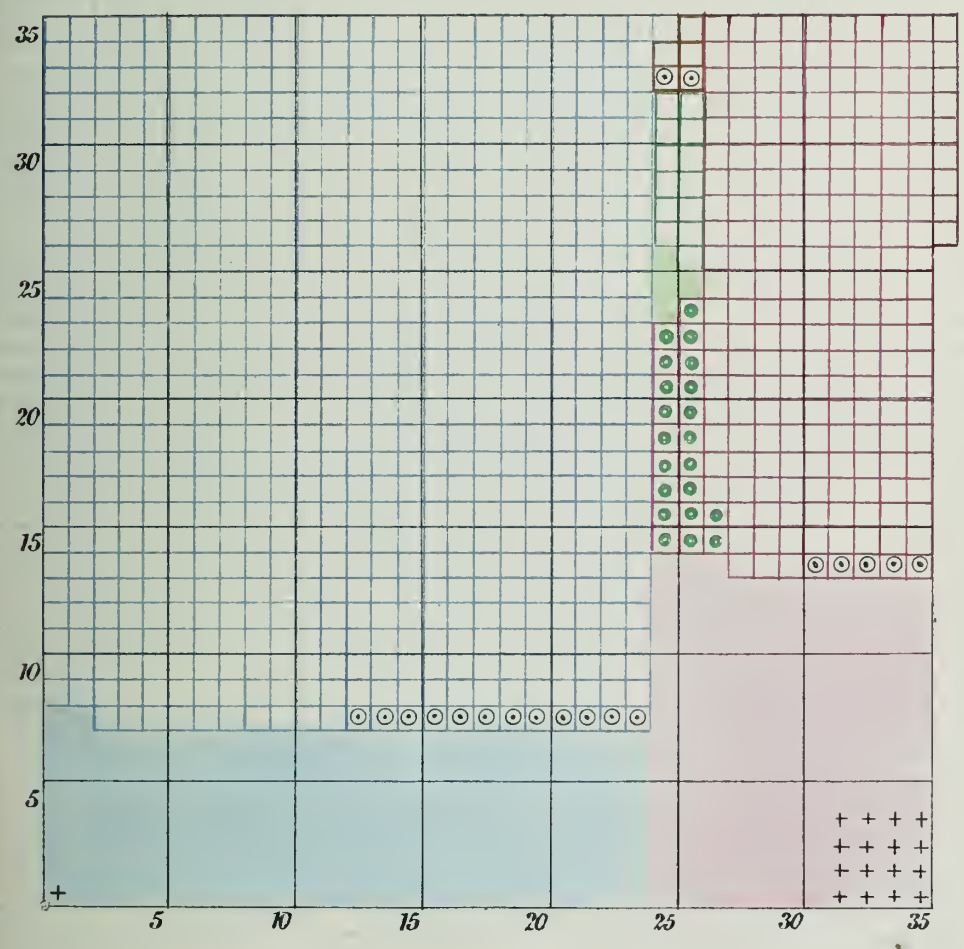
UNDER 10 YEARS OF AGE—361: *attacked*, 102; *not attacked*, 259.
Vaccinated, 78: *attacked*, 2; *not attacked*, 76.
Under vaccination, 10: *attacked*, 3; *not attacked*, 7.
Unvaccinated:—
(*a.*) *Vaccinated on removal of case*, 17: *none of whom were attacked.*
(*b.*) *Not vaccinated*, 256; *attacked*, 97; *not attacked*, 159; *died*, 12.

10 TO 30 YEARS—533: *attacked*, 150; *not attacked*, 383.
Vaccinated, 438: *attacked*, 104; *not attacked*, 334.
Under vaccination, 7: *attacked*, 1; *not attacked*, 6.
Unvaccinated:—
(*a.*) *Vaccinated on removal of case*, 4: *none of whom were attacked.*
(*b.*) *Not vaccinated*, 84: *attacked*, 45; *not attacked*, 39; *died*, 3.

30 YEARS AND OVER—331: *attacked*, 68; *not attacked*, 263.
Vaccinated, 316: *attacked*, 64; *not attacked*, 252; *died*, 1.
No information on vaccination, 5: *none attacked.*
Unvaccinated, 10: *attacked*, 4; *not attacked*, 6; *died*, 1.

AGE NOT ASCERTAINED—9.
Vaccinated, 9; *none attacked.*

VACCINATION DATA OF 1234 MEMBERS OF HOUSEHOLDS INVADED BY SMALL POX.



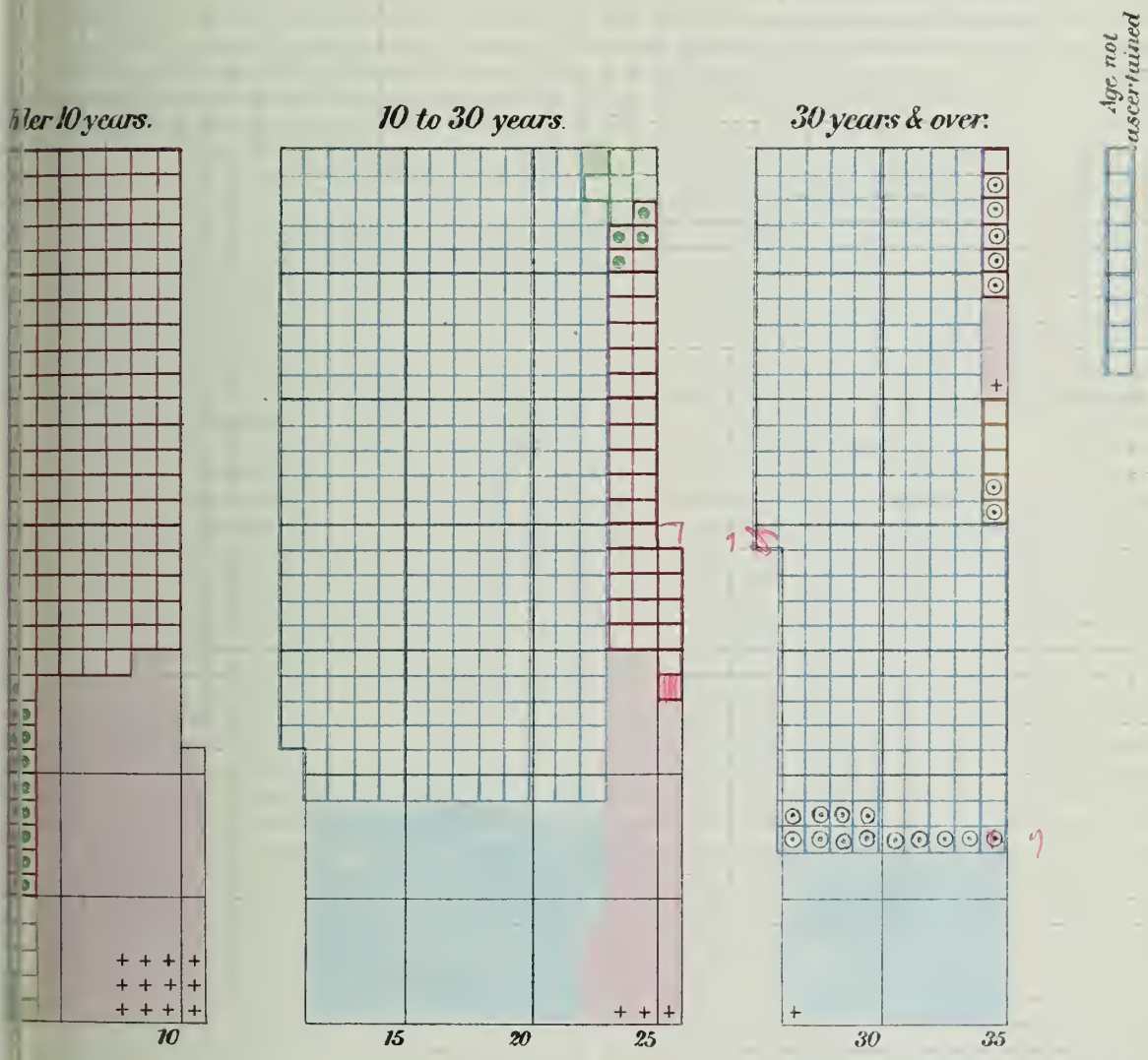
	attacked.	not attacked
Vaccinated	▭	▭
Under Vaccination	▭	▭
No information as to Vaccination	▭	▭
Unvaccinated:-		
a. Vaccinated at once		▭
b. Remained Unvaccinated	▭	▭

Previous Small Pox ⊙

Fatal Cases + + +

To face page 62 i.

VACCINATION DATA OF 1234 MEMBERS OF HOUSEHOLDS, INVADED BY SMALL POX, ARRANGED IN 3 AGE PERIODS.



For key see Chart VI, facing page 16. 62

page 62. (ii.)

65/6. 11-94.

TABLE XXXI.

ISOLATION AND VACCINATION.

—	Series A. Attacked.	Series A. Not Attacked.	Series B. Attacked.	Series B. Not Attacked.	Total. Attacked.	Total. Not Attacked.	—
Vaccinated	133	599	37	72	170	671	841
Re-vaccinated	5	89	1	20	6	109	—
Previous small-pox	—	12	—	—	—	12	—
Under vaccination	4	13	—	—	4	13	17
No information on vaccination	—	5	—	—	—	5	5
Previous small-pox	—	2	—	—	—	2	—
Unvaccinated:— Vaccinated on removal of case	—	19	—	2	—	21	371
Not vaccinated	123	196	23	8	146	204	
Previous small-pox	—	5	—	—	—	5	—
	260	832	60	82	320	914	1,234
Re-vaccinated	5	89	1	20	6	109	115
Previous small-pox	—	19	—	—	—	19	19

It will be seen that the attack-rate or incidence for the *vaccinated* class is in Series A., 18·1 per cent.; in Series B., 34 per cent.; that for the *unvaccinated* class is, in Series A., 36·4 per cent.; in Series B., 74·2 per cent.; showing the far greater proportion who suffered amongst those when the initial cases remained at home.

TABLE XXXII.

INITIAL CASES REMOVED TO HOSPITAL (SERIES A.).

—	Group I. 126 Households. Attacked.	Not Attacked.	Total.	Group II. 45 Households. Initial.	Later.	Not Attacked.	Total.	—
Vaccinated	85	494	579	15	33	105	153	732
Re-vaccinated	1	71	—	1	3	18	—	—
Previous small-pox.	—	4	—	—	—	8	—	—
Under vaccination	1	4	5	—	3	9	12	17
No information	—	5	5	—	—	—	—	5
Previous small-pox.	—	2	—	—	—	—	—	—
Unvaccinated:— Vaccinated on removal of case.	—	19	212	35	40	51	126	319
Remained unvaccinated.	48	145						
Previous small-pox.	—	5	—	—	—	—	—	—
	134	467	801	50	76	165	291	1,092

TABLE XXXIII.

INITIAL CASES REMAINED AT HOME (SERIES B.).

—	Group I. 7 Households. Attacked.	Not Attacked.	Total.	Group II. 15 Households. Initial.	Later.	Not Attacked.	Total.	—
Vaccinated	5	31	36	14	18	41	73	110
Re-vaccination	—	12	—	—	1	8	—	—
Under vaccination	—	—	—	—	—	—	—	—
Unvaccinated:—								
Vaccinated at once.	—	2	2	—	—	—	—	—
Remained unvaccinated.	2	1	3	2	19	7	28	30
	7	34	41	16	37	48	101	142

In Tables XXXII. and XXXIII. these series have been apportioned in each of the two main groups, so as to afford comparison between those households in which the cases remained at home, or were removed, in respect to the liability to cases subsequently arising in the house. The main fact has already been dwelt on in dealing with single and multiple cases, but the respective incidence in the vaccinated and unvaccinated may here be added, in the following tabular statement:—

INCIDENCE of SMALL-POX on the VACCINATED and UNVACCINATED MEMBERS of HOUSEHOLDS.

Series A. (171 *Households*).

—	Vaccinated Rate.	Unvaccinated Rate.
Group I. (126 households)	14·6 per cent.	22·6 per cent.
Group II. (45 households), all cases	31·3 „	59·5 „
„ „ later cases only.	23·9 „	43·9 „

Series B. (22 *Households*).

—		
Group I. (7 households)	13·5 per cent.	66·6 per cent.
Group II. (15 households), all cases	43·8 „	75·0 „
„ „ later cases only.	30·5 „	73·3 „

Lastly, in Tables XXXIV. to XXXVII., these series are sub-divided amongst age-periods, but the numbers in Series B. are too small to afford any just basis of comparison in this respect, and I may, therefore, leave them without further comment.

TABLE XXXIV.

GROUP I. SERIES A.—INITIAL CASES REMOVED TO HOSPITAL.

(126 households, 801 members, 134 attacked.)

—	Under 1 year. Attacked.	Not Attacked.	1 to 10 years. Attacked.	Not Attacked.	10 to 30 years. Attacked.	Not Attacked.	30 years and upwards. Attacked.	Not Attacked.	Age not ascertained. Attacked.	Not Attacked.	All Ages. Attacked.	Not attacked.
Vaccinated	—	1	—	64	57	247	29	173	—	9	86	494
Re-vaccinated	—	—	—	2	—	27	1	33	—	9	1	71
Previous small-pox.	—	—	—	—	—	—	—	4	—	—	—	4
No information on vaccination.	—	—	—	—	—	—	—	5	—	—	—	5
Previous small-pox.	—	—	—	—	—	—	—	2	—	—	—	2
Under vaccination.	—	—	—	1	1	3	—	—	—	—	1	4
Unvaccinated: Vaccinated at once.	—	—	—	15	—	4	—	—	—	—	—	19
Not vaccinated	2	16	25	99	17	24	3	6	—	—	47	145
Previous small-pox.	—	—	—	—	—	—	—	5	—	—	—	5
	2	17	25	179	75	278	32	184	—	18	134	667

Re-vaccinated, 72. (One attacked with small-pox.)
Previous small-pox, 11.

TABLE XXXV.

GROUP I. SERIES B.—INITIAL CASES REMAINED AT HOME.

(7 households, 41 members, 7 attacked.)

—	Under 1 year. Attacked.	Not Attacked.	1 to 10 years. Attacked.	Not Attacked.	10 to 30 years. Attacked.	Not Attacked.	30 years and upwards. Attacked.	Not Attacked.	All Ages. Attacked.	Not Attacked.
Vaccinated	—	—	—	1	3	22	2	8	5	31
Re-vaccinated	—	—	—	—	—	8	—	4	—	12
Unvaccinated: Vaccinated at once	—	—	—	2	—	—	—	—	—	2
Not vaccinated	1	—	—	—	1	1	—	—	2	1
	1	—	—	3	4	23	2	8	7	34

Re-vaccinated, 12.

TABLE XXXVI.

GROUP II. SERIES A.—INITIAL CASES REMOVED TO HOSPITAL.

(45 households; 291 members; 126 attacked.)

—	Under 1 Year.		1 to 10 Years.		10 to 30 Years.		30 Years upwards.		All Ages.	
	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.
Vaccinated	—	—	1	8	21	36	25	61	47	105
Re-vaccinated	—	—	—	—	1	6	3	12	4	18
Previous small-pox	—	—	—	—	—	—	—	8	—	8
Under vaccination	1	1	2	5	—	3	—	—	8	9
Unvaccinated	3	5	46	32	25	14	1	—	76	51
	4	6	49	45	47	53	26	61	126	165

Re-vaccinated, 28 (4 attacked with small-pox).
Previous small-pox, 8.

TABLE XXXVII.

GROUP II. SERIES B.—INITIAL CASES REMAINED AT HOME.

(15 households; 101 members; 53 attacked.

—	Under 1 Year.		1 to 10 Years.		10 to 30 Years.		30 Years up wards.		All Ages.	
	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.	Attacked.	Not Attacked.
Vaccinated	—	—	1	2	23	28	8	11	32	41
Re-vaccinated	—	—	—	2	1	4	—	2	1	8
Under vaccination	—	—	—	—	—	—	—	—	—	—
Unvaccinated	—	3	20	4	1	—	—	—	21	7
	—	3	21	6	24	28	8	11	53	48

Re-vaccinated, 9 (1 attacked with small-pox).

INCIDENCE of SMALL-POX on the VACCINATED and UNVACCINATED INMATES of 193 INVADED HOUSES.

From the particulars already furnished, it is possible to calculate the rates of incidence of small-pox upon the vaccinated and unvaccinated members of households, and to contrast these rates with the rates of proportion between the two classes of all members irrespective of age. Thus we have the following data :—(1) the number of invaded households, (2) the sizes of these households, (3) the number attacked in each, (4) the number of persons who were known to have been vaccinated, and of those who were known to be unvaccinated, as well as the number of those in each class who were attacked with the disease.

It will further be of interest to contrast in these particulars the houses of various size, and for this purpose we may divide them into two groups, namely, those having six inmates or less, and those having more than six inmates.

1. In 193 houses, having 1,234 inmates, there were 320 attacked with small-pox, an incidence rate of 259 per 1,000.

2. Of these 1,234 persons, 841 were vaccinated, a proportion of 681 per 1,000; 371 were unvaccinated, a proportion of 300 per 1,000.

3. Of the *vaccinated*, 170 were attacked with small-pox, an incidence rate of 202 per 1,000. Of the *unvaccinated*, 146 were attacked, an incidence rate of 393 per 1,000.

Houses with Six Inmates or less.

1. In 109 houses, having 500 inmates, 160 were attacked with small-pox, an incidence rate of 320 per 1,000.

2. Of these 500 persons, 354 were vaccinated, a proportion of 708 per 1,000. 140 were unvaccinated, a proportion of 280 per 1,000.

3. Of the *vaccinated*, 95 were attacked with small-pox, an incidence rate of 268 per 1,000. Of the *unvaccinated*, 63 were attacked, an incidence rate of 450 per 1,000.

Houses with more than Six Inmates.

1. In 84 houses, having 734 inmates, 160 were attacked with small-pox, an incidence rate of 218 per 1,000.

2. Of these 734 persons, 487 were vaccinated, a proportion of 663 per 1,000. 231 were unvaccinated, a proportion of 314 per 1,000.

3. Of the *vaccinated*, 75 were attacked with small-pox, an incidence rate of 154 per 1,000. Of the *unvaccinated*, 83 were attacked, an incidence rate of 359 per 1,000.

It may be of interest to compare the small-pox incidence in relation to the proportion of vaccinated and unvaccinated persons in these households, where (*a*) every one attacked was vaccinated, (*b*) every one attacked was unvaccinated, and (*c*) where those attacked included some vaccinated and some unvaccinated. We have thus three groups :—

Group A.—Houses in which all attacked with small-pox were *vaccinated*. This group comprises 91 houses.

Group B.—Houses in which all attacked with small-pox were *unvaccinated*. This group comprises 61 houses.

Group C.—Houses in which those attacked with small-pox were, some of them *vaccinated* and some *unvaccinated*. This group comprises 41 houses.

GROUP A.

1. In 91 houses, having 557 inmates, 109 were attacked with small-pox, an incidence rate of 195 per 1,000.

2. Of these 557 persons, 478 were vaccinated, a proportion of 858 per 1,000; 75 were unvaccinated, a proportion of 132 per 1,000.

3. Of the *vaccinated*, 109 were attacked with small-pox, an incidence rate of 228 per 1,000.

Houses with Six Inmates or less.

1. In 59 houses, having 258 inmates, 70 were attacked with small-pox, an incidence rate of 271 per 1,000.

2. Of these 258 persons, 221 were vaccinated, a proportion of 139 per 1,000; 36 were unvaccinated, a proportion of 139 per 1,000.

3. Of the *vaccinated*, 70 were attacked with small-pox, an incidence rate or 317 per 1,000.

Houses with more than Six Inmates.

1. In 32 houses, having 299 inmates, 39 were attacked with small-pox, an incidence rate of 130 per 1,000.

2. Of these 299 persons, 257 were vaccinated, a proportion of 859 per 1,000; 39 were unvaccinated, a proportion of 130 per 1,000.

3. Of the *vaccinated*, 39 were attacked with small-pox, an incidence rate of 155 per 1,000.

GROUP B.

1. In 61 houses, having 403 inmates, 86 were attacked with small-pox, an incidence rate of 213 per 1,000.

2. Of these 403 persons, 199 were vaccinated, a proportion of 493 per 1,000; 199 were unvaccinated, a proportion of 493 per 1,000.

3. Of the *unvaccinated*, 86 were attacked with small-pox, an incidence rate of 432 per 1,000.

Houses with Six Inmates or less.

1. In 30 houses, having 141 inmates, 37 were attacked with small-pox, an incidence rate of 262 per 1,000.

2. Of these 141 persons, 76 were vaccinated, a proportion of 539 per 1,000; 64 were unvaccinated, a proportion of 454 per 1,000.

3. Of the *unvaccinated*, 37 were attacked with small-pox, an incidence rate of 578 per 1,000.

Houses with more than Six Inmates.

1. In 31 houses, having 262 inmates, 49 were attacked with small-pox, an incidence rate of 187 per 1,000.

2. Of these 262 persons, 123 were vaccinated, a proportion of 469 per 1,000; 135 were unvaccinated, a proportion of 515 per 1,000.

3. Of the *unvaccinated*, 49 were attacked with small-pox, an incidence rate of 363 per 1,000.

Group C.

1. In 41 houses, having 274 inmates, 125 were attacked with small-pox, an incidence rate of 456 per 1,000.
2. Of these 274 persons, 164 were vaccinated, a proportion of 598 per 1,000; 97 were unvaccinated, a proportion of 354 per 1,000.
3. Of the *vaccinated*, 61 were attacked with small-pox, an incidence rate of 372 per 1,000; of the *unvaccinated*, 60 were attacked, an incidence rate of 618 per 1,000.

Houses with Six Inmates or less.

1. In 20 houses having 101 inmates, 53 were attacked with small-pox, an incidence rate of 524 per 1,000.
2. Of these 101 persons, 57 were vaccinated, a proportion of 564 per 1,000; 40 were unvaccinated, a proportion of 396 per 1,000.
3. Of the *vaccinated*, 25 were attacked with small-pox, an incidence rate of 438 per 1,000; of the *unvaccinated*, 26 were attacked, an incidence rate of 650 per 1,000.

Houses with more than Six Inmates.

1. In 21 houses, having 173 inmates, 72 were attacked with small-pox, an incidence rate of 416 per 1,000.
2. Of these 173 persons, 107 were vaccinated, a proportion of 618 per 1,000; 57 were unvaccinated, a proportion of 330 per 1,000.
3. Of the *vaccinated*, 36 were attacked with small-pox, an incidence rate of 336 per 1,000; of the *unvaccinated*, 34 were attacked, an incidence rate of 596 per 1,000.

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§ 15. *Supplementary Note.*

It may be of interest to contrast in a few particulars the experience of this outbreak of small-pox at Leicester, with that previously reported on at the Dewsbury Union, in 1891 to 1892. The following statistics show the chief points of comparison to which attention may be drawn.

Comparison of Small-pox Statistics.

—	Leicester, 1892–93.	Dewsbury Union, 1891–92.
Number of Cases	357	1,029
Males	181	521
Females	176	508
Death-rate	21 or 5·8 per cent.	110 or 10·7 per cent.

Age-Periods.	Cases.	Per cent.	Deaths.	Fatality.	Cases.	Per cent.	Deaths.	Fatality.
				%				%
Under 1 year	6	1·7	2	33·3	29	2·8	19	65·5
1 to 10 years	103	28·8	13	12·6	195	18·9	38	19·4
10 to 30 „	161	45·1	3	3·4	560	54·4	33	5·9
30 and over	87	24·3	3	3·4	238	23·1	20	8·4
Age not ascertained	—	—	—	—	7	0·6	—	—
	357	—	21	—	1,029	—	110	—

Relative Mortality at Different Ages.

	Leicester.	Dewsbury Union.
Under 1 year	9·5 per cent.	17·2 per cent.
1 to 10 years	61·9 „	34·5 „
10 to 30 „	14·3 „	30·0 „
30 and over	14·3 „	18·1 „

Statistics of the Unvaccinated.

	Leicester.	Dewsbury Union.
Total Unvaccinated	153 or 42·8 per cent.	346 or 33·6 per cent.
Deaths	19 or 12·4 „	89 or 25·7 „

Age Periods.	No. Attacked.	Proportion of all Cases.	Proportion of all Unvaccinated.	No. Attacked.	Proportion of all Cases.	Proportion of all Unvaccinated.
		%	%		%	%
Under 1 year	5	83·3	3·2	21	72·4	6·0
1 to 10 years	99	96·1	64·7	137	70·2	39·6
10 to 30 „	45	27·9	29·4	165	29·4	47·7
30 and over	4	4·6	2·6	22	9·2	6·3
Age not ascertained	—	—	—	1	—	0·3
	153	—	—	346	—	—

Statistics of Small-pox in Invaded Houses (of which particulars obtained).

—	Leicester.	Dewsbury Union.
Invaded Houses	193	544
Total Inmates	1,234	3,000
Attacked with Small-pox.	320 or 25·9 per cent.	887 or 29·5 per cent.

At Ages.	Attacked.	Not Attacked.	Rate.	Attacked.	Not Attacked.	Rate.
			%			%
Under 1 year	7	26	21·2	25	50	33·3
1 to 10 years	95	233	28·9	178	476	27·2
10 to 30 „	150	383	28·1	482	867	35·7
30 and over	68	263	20·5	202	699	32·3
Age not ascertained	—	9	—	—	21	—
	320	914	—	887	2,113	—

Single cases in	127 Houses.	355 Houses.
Total Inmates	795	1,840
Attacked with Small-pox.	127 or 16 per cent.	355 or 19·2 per cent.
Multiple cases in	66 Houses.	189 Houses.
Total Inmates	439	1,160
Attacked with Small-pox.	193 or 44 per cent.	532 or 45·8 per cent.

Proportions of the Unvaccinated in above Households.

—	Attacked.	Not Attacked.	Attacked.	Not Attacked.
All Classes	320	914	887	2,113
Unvaccinated	145	223	294	233
Proportion of Unvaccinated.	45·3 p.c.	24·4 p.c.	33·1 p.c.	11·0 p.c.
Attack Rate among Unvaccinated.	39·4 per cent.		55·7 per cent.	
Ditto.	145 | 218		293 | 186	
Exclusive of those who had had Small-pox previously.	39·9 per cent.		61·1 per cent.	

SMALL-POX INCIDENCE on VACCINATED and UNVACCINATED.

—	LEICESTER.			DEWSBURY UNION.		
	Houses with Six Inmates or less.	Houses with more than Six Inmates.	All Houses.	Houses with Six Inmates or less.	Houses with more than Six Inmates.	All Houses.
Number of Houses - -	109	84	193	384	160	544
Inmates—total - - -	500	734	1,234	1,682	1,318	3,000
Vaccinated - - -	354	487	841	1,247	1,024	2,271
Do. per 1,000 - -	708	663	681	741	769	757
Unvaccinated - - -	140	231	371	314	213	527
Do. per 1,000 -	280	314	300	186	161	175
Attacked—total - - -	160	160	320	554	333	887
Incidence per 1,000 - -	320	218	259	329	252	295
Vaccinated - - -	95	75	170	344	200	544
Incidence per 1,000 - -	268	154	202	275	195	239
Unvaccinated - - -	63	83	146	180	114	294
Incidence per 1,000 - -	450	359	393	573	535	557

GROUP A.—*All attacked were vaccinated (or 'under' or 'alleged').*

Number of Houses - -	59	32	91	235	89	324
Inmates—total - - -	258	299	557	983	746	1,729
Vaccinated - - -	221	257	478	841	672	1,513
Do. per 1,000 - -	856	859	858	855	900	875
Unvaccinated - - -	36	39	75	66	38	104
Do. per 1,000 -	139	130	132	67	51	60
Attacked—total - - -	70	39	109	297	144	441
Incidence per 1,000 - -	271	130	195	302	193	255
Vaccinated - - -	70	39	109	273	136	409
Incidence per 1,000 - -	317	155	228	324	202	270
Unvaccinated -	—	—	—	—	—	—
Incidence per 1,000 - -	—	—	—	—	—	—

GROUP B.—*All attacked were unvaccinated.*

—	LEICESTER.			DEWSBURY UNION.		
	Houses with Six Inmates or less.	Houses with more than Six Inmates.	All Houses.	Houses with Six Inmates.	Houses with more than Six Inmates.	[illegible]
Number of Houses - -	30	31	61	99	34	1
Inmates—total - - -	141	262	403	459	272	7
Vaccinated - - -	76	123	199	258	163	4
Do. per 1,000 - -	539	469	493	562	599	5
Unvaccinated - - -	64	135	199	167	94	2
Do. per 1,000 -	454	515	493	363	345	3
Attacked—total - - -	37	49	86	116	52	1
Incidence per 1,000 - -	262	187	213	252	191	2
Vaccinated - - -	—	—	—	—	—	-
Incidence per 1,000 -	—	—	—	—	—	-
Unvaccinated - - -	37	49	86	115	50	1
Incidence per 1,000 -	578	363	432	688	532	6

GROUP C.—*Attacked were vaccinated and unvaccinated.*

Number of Houses - -	20	21	41	50	37	
Inmates—total - - -	101	173	274	240	300	5
Vaccinated - - -	57	107	164	148	189	3
Do. per 1,000 - -	564	618	598	616	630	6
Unvaccinated - - -	40	57	97	81	81	1
Do. per 1,000 -	396	330	354	337	270	3
Attacked—total - - -	53	72	125	141	137	2
Incidence per 1,000 - -	524	416	456	587	456	5
Vaccinated - - -	25	36	61	71	64	1
Incidence per 1,000 - -	438	336	372	480	338	4
Unvaccinated - - -	26	34	60	65	64	1
Incidence per 1,000 - -	650	596	618	802	790	7

SIDNEY COUPLAND, M.D.

MAP OF LEICESTER SHOWING HOUSES INVADED BY SMALL POX 1892-93.

GILROES FARM
PARISH OF GILROES
GILROES
BIRDS NEST FARM
St Johns Stone
REMAINS OF
Old Sewage Pumping Station
LEICESER ABBEY
REMAINS OF
ABBEY PARK
NEW PARK HOUSE
NEW PARKS
THE PASTURE
BATHS
FREAKES GROUND PARISH
NEWFOUND POOL PARISH
NEW PARK FARM
ASHLEIGH HOUSE
DANE HILLS
WYGGESTON HOSPITAL
BRAUNSTONE PARK
BRAUNSTONE HOUSE
WESTCOTES FARM
RED HOUSE FARM
St Peters Chu
BRAUNSTONE
OLD HALL FARM
PARISH OF BRAUNSTONE
NEW FIELDS
ROWLEY FIELDS
BRAUNSTON LANE
RIVER SOAR
LEICESTER & BURTON BRANCH
MIDLAND RAILWAY
PARISH OF LUBBESTHORPE
MILL FIELD FARM
WHITE HOUSE
BELGRAVE ROAD GROUNDS
ALLOTMENT GARDENS
RED HOUSE FARM
Viaduct
PHOENIX IRON WORKS
RECREATION GROUND
GREAT NORTHERN STATION
ENGINE SHED
RAILWAY WHARF
Gas Works
Old Mill
Brook
Meeting Room
Girls Wyggeston School
Market Place
Boys School
STATION
Church
Chapel
Infirmary
Gaol
Barking Place
Recreation Ground
South Fields
Lock
FREEMANS WEIR
LEICESTERSHIRE & UNION CA.
CATTLE MARKET
CEMETERY
FREEMEN'S COMMON
St MARY'S MILLS
AYLESTONE ROAD GAS WORKS
Brighton Brick Works
Saffron Lane Brick Works
AYLESTONE PARK
AYLESTON PARK GROUNDS
VILLAGE OF AYLESTONE
NORTHAMPTON & LEICESTER CANAL
NORTHAMPTON & LEICESTER RAILWAY
NORTHAMPTON LOOP
NORTHAMPTON ROAD
HUMBERSTONE
HUMBERSTONE GATE
HUMBERSTONE ROAD
HUMBERSTONE STATION
NEWARK ST
HALFORD ST
ST MARY'S PLACE
ST MARY'S CHU
ST JAMES CHU
ST PAUL'S CHU
ST MARK'S CHU
ST PETER'S CHU
ST ANDREW'S CHU
ST JOHN'S CHU
ST BARNABAS CH
ST JAMES CHU
ST JOHN'S CHU
ST MARY MAGDALEN'S CHURCH
ST PETER'S CHU
ST JAMES CHU
ST JOHN'S CHU
ST MARK'S CHU
ST PAUL'S CHU
ST MARY'S CHU
NORTHFIELD HOUSE
HUMBERSTONE HOUSE
BOROUGH LUNATIC ASYLUM
HUMBERSTONE LODGE
THE GRANGE
Chapel
THE COTTAGE
HUMBERSTONE BRICK & TILE WORKS
VICTORIA NURSERY
THE HALL
PARISH OF HUMBERSTONE
NEW HUMBERSTONE
HUMBERSTONE STATION
COVERTON ROAD
UPPINGHAM ROAD
SCRAPTOFT ROAD
MEADOW HOUSE
G N R (LEICESTER BRANCH)
NEW EVINGTON
EVINGTON LANE
EVINGTON ROAD
SPINNEY HILL PARK
HIGHFIELDS
PARISH OF
EVINGTON LODGE
PAVILION
CRICKET GROUND
VICTORIA PARK
ASHFIELD
BROOKFIELD
THE HOLT
EVINGTON PARKS
LEICESTERSHIRE & RUTLAND LUNATIC ASYLUM
THE SHRUBBERY
STONELEIGH
THE HOLME
KNIGHTON FRITH
CLARENDON PARK
STONEYGATE
LYNWOOD
ALLAN DALE
ELMSLEIGH HALL
THE LODGE
THE WOODLANDS
KNIGHTON ROAD
KNIGHTON DRIVE
KNIGHTON HOUSE
KNIGHTON HAYES
SHIRLEY ROAD
PORTLAND TOWERS
SOUTH KNIGHTON
KNIGHTON HALL
VILLAGE OF KNIGHTON
KNIGHTON FIELDS PRIVATE ROAD
KNIGHTON LANE
CHAPEL LANE
KNIGHTON CHURCH ROAD
St Mary Magdalens Church
Grand Stand
COURSE
PARISH OF OADBY